



VERIFICATION OF A TRANSLATION

#21
MA 10/10
RECEIVED

SEP 29 2003

Technology Center 2600

I, the below named translator, hereby declare that:

My name and post office address are stated below;

That I am knowledgeable in the English and Japanese languages and
that I believe the following is a true and complete translation into the
English language of Japanese Patent Application No. 9-352048 filed in the
Japanese Patent Office on the 5th day of December, 1997 for Letters Patent.

Signed this 16th day of September, 2003

Tamiko Endo

Full name of Translator

Signature of Translator

9-23, Sasamecho, Kamakura-shi,

Kanagawa, Japan

Post Office Address

JAPAN PATENT OFFICE

This is to certify that the annexed is a true copy of the following application as filed with this Office.

Date of Application: December 5, 1997

Application Number: Patent Application No. 9-352048

Applicant(s): Matsushita Electric Industrial Co., Ltd.

October 30, 1998

Commissioner,
Japan Patent Office
Cert. No. 10-3087852

【Document Name】 PATENT APPLICATION

【Reference Number】 2030794074

【Filing Date】 December 5, 1997

【To】 The Commissioner of the Patent Office

【IPC】 H04N 5/262

【Title of the Invention】 Program Information Preparing and
Transmitting Apparatus or Program
Information Receiving Apparatus

【Number of Claims】 39

【Inventor】

 【Address or Abode】 c/o Matsushita Electric Industrial
 Co., Ltd., 1006, Oaza Kadoma, Kadoma-shi
 Osaka

 【Name】 Yuko ARAI

【Inventor】

 【Address or Abode】 c/o Matsushita Electric Industrial
 Co., Ltd., 1006, Oaza Kadoma, Kadoma-shi
 Osaka

 【Name】 Takeshi NAGAO

【Inventor】

 【Address or Abode】 c/o Matsushita Electric Industrial
 Co., Ltd., 1006, Oaza Kadoma, Kadoma-shi
 Osaka

 【Name】 Kenichi FUJITA

【Inventor】

 【Address or Abode】 c/o Matsushita Electric Industrial
 Co., Ltd., 1006, Oaza Kadoma, Kadoma-shi
 Osaka

 【Name】 Hiroki SHINOHARA

【Inventor】

 【Address or Abode】 c/o Matsushita Electric Industrial
 Co., Ltd., 1006, Oaza Kadoma, Kadoma-shi
 Osaka

 【Name】 Takayuki SUZUKI

【Inventor】

【Address or Abode】 c/o Matsushita Electric Industrial
Co., Ltd., 1006, Oaza Kadoma, Kadoma-shi
Osaka
【Name】 Aki NAKAGAWA

【Applicant】

【Identification Number】 000005821
【Name or Designation】 Matsushita Electric Industrial
Co., Ltd.
【Representative】 Yoichi MORISHITA

【Agent】

【Identification Number】 100099254
【Patent Attorney】
【Name or Designation】 Masaaki EN

【Agent】

【Identification Number】 100100918
【Patent Attorney】
【Name or Designation】 Kouji OHASHI

【Agent】

【Identification Number】 100105485
【Patent Attorney】
【Name or Designation】 Masanori HIRANO

【Agent】

【Identification Number】 100108729
【Patent Attorney】
【Name or Designation】 Hiroki HAYASHI

【Indication of Fee】

【Means of Payment】 Deposit
【Deposit Ledger Number】 037419
【Amount of Payment】 ¥ 21,000

[List of Submitting Object]

【Object Name】	Specification	1
【Object Name】	Drawings	1
【Object Name】	Abstract	1
【General Power of Attorney Number】	9102150	
【General Power of Attorney Number】	9116348	
【General Power of Attorney Number】	9600935	
【General Power of Attorney Number】	9700485	

[Document Name] Specification

[Title of the Invention] PROGRAM INFORMATION PREPARING AND TRANSMITTING APPARATUS OR PROGRAM INFORMATION RECEIVING APPARATUS

[Scope of the Claims for Patent]

[Claim 1] A program information preparing and transmitting apparatus, characterized by preparing and transmitting common program guide information describing services of a plurality of broadcast enterprisers and individual program information describing services of individual broadcast enterprisers on every broadcast enterpriser basis.

[Claim 2] A method for preparing and transmitting program information, characterized by preparing and transmitting common program information describing services of a plurality of broadcast enterprisers and individual program information describing services of individual broadcast enterprisers on every broadcast enterpriser basis.

[Claim 3] A program information receiving apparatus, characterized by preparing and displaying a common program guide describing services of a plurality of broadcast enterprisers and an individual program guide describing services of individual broadcast enterprisers on every broadcast enterpriser basis.

[Claim 4] A program information preparing and transmitting apparatus characterized by comprising; a program information preparing unit for preparing program information on the basis of program information detail-setting information describing a degree in detail of program information transmitted to a transport stream through which services are broadcasted and program information transmitted to a transport stream through which no broadcasting is performed; and a program information transmitting unit for distributing and outputting program information to each of the transport streams.

[Claim 5] A program information preparing and transmitting apparatus, characterized by comprising; a program information transmitting unit for preparing program information for each broadcast enterpriser, on the basis of broadcast enterpriser service correspondence information indicating a list of broadcast enterprisers' services and broadcast enterprisers, and program information detail-setting information describing a degree in detail of program information transmitted to a transport stream through which at least any one of the services presented by a broadcast enterpriser is broadcasted and program information transmitted to a transport stream through which no broadcasting is performed; and a program information transmitting unit for distributing and outputting program information to each transport stream.

[Claim 6] A program information preparing and transmitting apparatus according to Claim 5, characterized by comprising a program information multiplexing unit for multiplexing and transmitting program information.

[Claim 7] A program information preparing and transmitting apparatus according to Claim 6, characterized by further comprising a common program information preparing unit for preparing common program information which is transmitted to all transport streams with identical contents, wherein said program information multiplexing unit is so arranged as to multiplex said common program information transmitted to all the transport streams and a plurality of program information pieces.

[Claim 8] A program information receiving apparatus, characterized in that a list of services presented by a broadcast enterpriser who presents services of a currently selected program is obtained, upon displaying a program guide, from broadcast enterpriser service correspondence information, thereby displaying a program guide indicating only programs that belong to the services indicated in said service list.

[Claim 9] A program information transmitting apparatus, wherein program information provided with information for specifying a service which is initially and automatically selected upon designation of a broadcast enterpriser, is prepared and transmitted by a program information preparing unit.

[Claim 10] A program information receiving apparatus, wherein a service provided with service specifying information is automatically selected by a broadcast receiving terminal upon designation of a broadcast enterpriser.

[Claim 11] A program information preparing and transmitting apparatus according to Claim 9, wherein program information provided with information for specifying a viewer's attribute suited for a service is prepared and transmitted by said program information preparing unit.

[Claim 12] A program information receiving apparatus according to Claim 10, wherein a service is automatically selected by a broadcast receiving terminal on designation of a broadcast enterpriser so that a viewer's attribute provided to said program information coincides with a viewer's attribute preset in the broadcast receiving terminal.

[Claim 13] A program information preparing and transmitting apparatus according to Claim 9, wherein program information provided with information for specifying a service genre is prepared and transmitted by said program information preparing unit.

[Claim 14] A program information receiving apparatus according to Claim 10, wherein a service is automatically selected by a broadcast receiving terminal on

designation of a broadcast enterpriser so that a genre provided to said program information coincides with a viewer-oriented genre preset in the broadcast receiving terminal.

[Claim 15] A program information preparing and transmitting apparatus, characterized by preparing and transmitting program information provided with program relation describing information indicating that a program to be broadcasted and a program not to be broadcasted are identical.

[Claim 16] A method for preparing and transmitting program information, characterized by preparing and transmitting program information provided with program relation describing information indicating that a program to be broadcasted and a program not to be broadcasted are identical.

[Claim 17] A program information receiving apparatus, characterized by displaying a program guide indicating that a program to be broadcasted and a program not to be broadcasted are identical.

[Claim 18] A program information preparing and transmitting apparatus, characterized in that program information to which information of a virtual program not to be broadcasted, for referring to program information of a program to be broadcasted, is prepared and transmitted by a program information preparing unit.

[Claim 19] A program information receiving apparatus, characterized by inputting program information wherein information referring to program information of a program to be broadcasted is added to information of a virtual program not to be broadcasted, thereby visually indicating identity between a program not on air and a program referred to.

[Claim 20] A program information receiving apparatus, characterized by arranging such that program information wherein information referring to program information of a program to be broadcasted is added to information of a virtual program not to be broadcasted is inputted, whereby all or a portion of program information of a program to be broadcasted, to which said programs refer, is indicated in a column of programs not on air, and where any of said programs is selected from a program guide, the selection of all of programs actually on air and programs referring thereto but not broadcasted is visually indicated.

[Claim 21] A program information preparing and transmitting apparatus, characterized by having such an arrangement that program information for giving a program transmission bandwidth of a program to program information is prepared by use of a program information preparing unit and transmitted.

[Claim 22] A program information receiving apparatus, characterized by having such an arrangement that program qualities imparted to program

information for each program are indicated as a visually displayed program guide.

[Claim 23] A program information preparing and transmitting apparatus, characterized by having such an arrangement that program information provided with broadcast enterprisers, time and transmission bandwidths is prepared by use of a program information preparing unit and transmitted.

[Claim 24] A program information receiving apparatus, characterized by arranging such that a program guide is displayed in three-dimensional fashion of broadcast enterprisers, time and transmission bandwidths.

[Claim 25] A program information receiving apparatus, characterized by arranging such that in case where a program to be selected is switched to by selection with a program selecting means, the switching is not made on a subsequent program without selection of the program to be switched to provided that a program to be switched to refers to program information of the same program as one before the switching or refers to program information of the program before the switching, or a program before the switching refers to program information of a program to be switched to.

[Claim 26] A program information receiving apparatus according to Claim 25, characterized by arranging such that upon switching over of a viewing service, in case where a program of a service after the switching refers to program information of other program, service identification information of a service after the switching and service identification information of a service that broadcasts a program referring to the same program as said program referred to, are displayed, or in case where a program of a service after the switching is referred to by other program, service identification information of a service after the switching and service identification information of a service that broadcasts a program referring to the program of the service after the switching are displayed.

[Claim 27] A program information preparing and transmitting unit, characterized by transmitting program information in which services or programs are hierarchically described.

[Claim 28] A method for preparing and transmitting program information, characterized by transmitting program information in which services or programs are hierarchically described.

[Claim 29] A program information receiving apparatus, characterized by displaying a program guide in which services or programs are hierarchically described.

[Claim 30] A program information preparing and transmitting apparatus, characterized by arranging such that in case where a plurality of programs are broadcasted at the same time, program information in which services or programs

that belong to the services are hierarchically indicated is prepared by a program information preparing unit and transmitted, by defining one virtual service or program and describing said plurality of services or a portion or all of a program as one group in program information of said virtual service or program.

[Claim 31] A program information preparing and transmitting apparatus according to Claim 30, characterized by arranging such that only information on superordinate services or programs of hierarchical description is transmitted to all transport streams, and program information on sub-services are transmitted to only transport streams for actual transmission of sub-services.

[Claim 32] A program information preparing and transmitting unit according to Claim 31, characterized by arranging such that program information on said sub-services is transmitted to only transport streams for transmission of services provided by a broadcast enterpriser that presents the sub-services.

[Claim 33] A program information receiving apparatus, characterized by arranging such that program information prepared and transmitted by the program information preparing and transmitting apparatus recited in Claim 30 is received for separately displaying program guides for main services and sub-services, and upon selection of a main service or one of the programs that belongs to the main service from the displayed program guides, a sub-service program guide of a lower hierarchy is displayed.

[Claim 34] A program information preparing and transmitting apparatus, characterized in that a service program correspondence table for providing program information with specification of a sub-service to be initially selected upon selection of a main service or one of the programs that belongs to the main service is prepared and transmitted by a program information preparing unit.

[Claim 35] A program information receiving apparatus, characterized by arranging such that a specified sub-service is selected upon selection of a main service.

[Claim 36] A program information preparing and transmitting apparatus, characterized in that a service program correspondence table for providing program information with a sub-service-selectable viewer's attribute is prepared and transmitted by a program information preparing unit.

[Claim 37] A program information receiving apparatus, characterized by arranging such that when a main service or one of the programs that belongs to the main service is selected, comparison is made between a viewer's attribute and a selectable viewer's attribute that has been imparted to program information, thereby permitting a matched sub-service to be selected from among the sub-services included in the main service.

[Claim 38] A program information preparing and transmitting apparatus, characterized in that a service program correspondence table for providing program information with a sub-service genre is prepared and transmitted by use of a program information preparing unit.

[Claim 39] A program information receiving apparatus, characterized by arranging such that when a main service or one of the programs that belongs to the main services is selected, comparison is made between a genre preset by a viewer and a sub-service genre that has been given to program information, thereby permitting a matched sub-service to be selected from among the sub-services included in the main service.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

This invention relates to a broadcasting system in which program information multiplexed with video and audio signals, and more particularly, an apparatus for preparing and transmitting program information and an apparatus for receiving the transmitted program information and displaying a program guide.

[0002]

[Prior Art]

In digital satellite broadcasting, video and audio signals are broadcasted according to the MPEG2 in which a plurality of video and audio signals are packeted and multiplexed, and transmitted in the form of a single transport stream (TS). Other than the packeted video and audio signals, program information (including control information required for multiplexing and transmitting the video and audio information signals, and EPG information for preparing the program guide; which are both defined by the MPEG2 and DVB) is also transmitted. The program information is described in the form of a section type table (which is stipulated by the MPEG2 or DVB).

[0003]

Fig. 33 shows an arrangement of an ordinary digital broadcasting system including a central broadcasting station system. In the central broadcasting station system of Fig. 33, a video/audio system (video stream producing system in the figure) is provided separately from a program information system (EPG preparing and transmitting apparatus in the figure), and signals of both of which systems are outputted to a multiplexer (TS multiplexer and up-link system in the figure). Program scheduling information is prepared and kept by an image and program information organizing system which controls the three systems shown in the figure. The program information system (the EPG preparing and transmitting

apparatus) receives the program scheduling information from the image and program information organizing system, and prepares program information (including program information required for multiplexing and transmitting the video and audio information signals, and additional information for preparing the program information). Thus prepared program information is transmitted to the TS multiplexer and up-link system and received by an every home receiver (IRD) through a satellite. The structure of the receiver (IRD) is described hereinlater.

[0004]

A cipher key managing and producing system and an accounting information collecting system in Fig. 33 are omitted from the description as they have no particular relation to the present invention.

[0005]

[Problems to be Solved by the Invention]

In the ordinary digital broadcasting system shown in Fig. 33, the program information is prepared by a single program information preparing unit, and a program guide which enters programs of all the broadcast enterprisers (hereinafter designated as a common program guide) is displayed. Thus it has been a problem that a program guide of each broadcast enterpriser (hereinafter designated as an individual program guide) cannot be displayed. Even though a broadcast enterpriser is ready for providing various services, all the services in the program guide are displayed in a similar format, or, at the most, such service as an HDTV is indicated. Thus, a problem has been arisen in that features of the services are difficult to be realized through the program guide.

[0006]

In order to solve the problems set forth above, an object of the present invention is to provide an apparatus for preparing and transmitting program information, which is able to display both the common program guide and the individual program guide wherein a band is efficiently utilized. Further, it is another object of the present invention to provide an apparatus for receiving program information, which receives the program information as mentioned above and displays the common program guide in distinction from the individual program guide.

[0007]

[Means for Solving the Problems]

In order to solve the problems, the feature of the invention resides in preparing and transmitting common program information indicating services of a plurality of broadcast enterprisers and individual program information indicating services of individual broadcast enterprisers. Another feature of the invention

resides in obtaining a list of services provided by a broadcast enterpriser who provides the services of currently selected program rather than obtaining information corresponding to the services of a broadcast enterpriser, and displaying a program guide which only indicates the programs that belong to the services given in the services list. Still another feature of the invention resides in preparing program information, by a program information preparing unit, in which reference information for a broadcasted program is added to the information of non-broadcasted virtual program, for transmission. Also, a further feature of the invention resides in preparing, upon simultaneously broadcasting a plurality of programs, program information by a program information preparing unit, in which services or programs that belong to the services are hierarchally shown by defining a single virtual program and by indicating in the program information a portion of the plurality of programs or all the programs as a single group, for transmission.

[0008]

Thus the program information is prepared on the basis of the information corresponding to the broadcast enterpriser and the information on the detailed degree of program information, and then transmitted. Therefore, on receiving the program information, a receiving terminal unit is enabled to display both the common program guide and the individual program guide on the TV monitor, while efficiently utilizing a band.

[0009]

[Embodiments of the Invention]

The invention recited in Claim 1 is directed to a program information preparing and transmitting apparatus, which is characterized by preparing and transmitting common program guide information describing services of a plurality of broadcast enterprisers and individual program information describing services of individual broadcast enterprisers on every broadcast enterpriser basis. This invention has such a feature that common program information and individual program information can be prepared and transmitted.

[0010]

The invention recited in Claim 2 is directed to a method for preparing and transmitting program information, which is characterized by preparing and transmitting common program information describing services of a plurality of broadcast enterprisers and individual program information describing services of individual broadcast enterprisers on every broadcast enterpriser basis. This invention has such a feature that common program information and individual program information can be prepared and transmitted.

[0011]

The invention recited in Claim 3 is directed to a program information receiving apparatus, which is characterized by preparing and describing a common program guide describing services of a plurality of broadcast enterprisers and an individual program guide describing services of individual broadcast enterprisers on every broadcast enterpriser basis. This invention has such a feature that a common program guide and an individual program guide can be displayed.

[0012]

The invention recited in Claim 4 is directed to a program information preparing and transmitting apparatus, which is characterized by comprising: a program information preparing unit for preparing program information on the basis of program information detail-setting information describing a detailed degree of program information transmitted to a transport stream through which services are broadcasted and program information transmitted to a transport stream through which no broadcasting is performed; and a program information transmitting unit for distributing and outputting program information to each of transport streams. This invention has such a feature that common program information and individual program information can be prepared and transmitted while effectively utilizing a band.

[0013]

The invention recited in Claim 5 is directed to a program information preparing and transmitting unit, which is characterized by comprising: a program information transmitting unit for preparing program information for each broadcast enterpriser, on the basis of broadcast enterpriser service correspondence information indicating a list of broadcast enterprisers' services and broadcast enterprisers, and program information detail-setting information describing a detailed degree of program information transmitted to a transport stream through which at least any one of the services provided by a broadcast enterpriser is broadcasted and program information transmitted to a transport stream through which no broadcasting is performed; and a program information transmitting unit for distributing and outputting program information to each transport stream. This invention has such a feature that program information is prepared based on the broadcast enterpriser service correspondence information and program information detail degree setting information, followed by transmission, and therefore common program information and individual program information can be prepared and transmitted while effectively utilizing a band.

[0014]

The invention recited in Claim 6 is directed to a program information preparing and transmitting unit according to Claim 5, characterized by comprising a

program information multiplexing unit for multiplexing and transmitting program information. This invention has such a feature that, in addition to the feature of Claim 5, each broadcast enterpriser only has to prepare its own program information and there is no necessity of preparing information of other stations.

[0015]

The invention recited in Claim 7 is directed to a program information preparing and transmitting unit according to Claim 6, characterized by comprising a common program information preparing unit for preparing common program information which is transmitted to all transport streams with identical contents, while permitting said program information multiplexing unit to multiplex said common program information transmitted to all the transport streams and a plurality of program information pieces. This invention has such a feature that each broadcast enterpriser has no necessity of preparing common portions of common program information.

[0016]

The invention recited in Claim 8 is directed to a program information receiving apparatus characterized by obtaining from broadcast enterpriser service correspondence information, in displaying a program guide, a list of services presented by a broadcast enterpriser who presents services of a currently selected program, thereby displaying a program guide indicating only programs that belong to the services indicated in the service list. This invention has such a feature that an individual program guide of each broadcast enterpriser can be displayed only during the broadcast enterpriser's services are viewed, thereby enabling avoidance of a trouble between broadcast enterprisers, a trouble that viewing of services is interrupted by displaying a program guide of other broadcast enterpriser while services of one broadcast enterpriser is viewed.

[0017]

The invention recited in Claim 9 is directed to a program information transmitting apparatus wherein program information provided with information for specifying a service which is initially and automatically selected upon designation of a broadcast enterpriser, is prepared and transmitted by a program information preparing unit. This invention has such a feature that a broadcast enterpriser can specify a program provided by a particular broadcast enterpriser, which is initially displayed so as to be effectively utilized for advertisement.

[0018]

The invention recited in Claim 10 is directed to a program information receiving apparatus wherein a service provided with service specifying information is automatically selected by a broadcast receiving terminal upon designation of a

broadcast enterpriser. This invention has such a feature that a service provided with service specifying information can be automatically selected by the broadcast receiving terminal.

[0019]

The invention recited in Claim 1 is directed to a program information preparing and transmitting apparatus according to Claim 9, wherein program information provided with information for specifying a viewer's attribute appropriate for a service is prepared and transmitted by the program information preparing unit. This invention has such a feature that a program that matches a viewer's attribute can be automatically selected from a program guide inherent to a broadcast enterpriser.

[0020]

The invention recited in Claim 12 is directed to a program information receiving apparatus according to Claim 10, wherein a service is automatically selected by a broadcast receiving terminal on designation of a broadcast enterpriser so that a viewer's attribute provided to said program information matches a viewer's attribute preset in the broadcast receiving terminal. This invention has such a feature that a program that matches a viewer's taste can be automatically selected from a program guide inherent to a broadcast enterpriser.

[0021]

The invention recited in Claim 13 is directed to a program information preparing and transmitting apparatus according to Claim 9, wherein program information provided with information for specifying a service genre is prepared and transmitted by said program information preparing unit. This invention has such a feature that program information that matches a viewer's taste can be prepared.

[0022]

The invention recited in Claim 14 is directed to a program information receiving apparatus according to Claim 10, wherein a service is automatically selected by a broadcast receiving terminal on designation of a broadcast enterpriser so that a genre provided to said program information matches a genre of a viewer's taste preset in the broadcast receiving terminal. This invention has such a feature that a program that matches a viewer's taste can be automatically selected from a program guide original to a broadcast enterpriser.

[0023]

The invention recited in Claim 15 is directed to a program information preparing and transmitting apparatus, which is characterized by preparing and transmitting program information provided with program relation describing information for indicating that a program to be broadcasted and a program not to be

broadcasted are identical. This invention has such a feature that transmission efficiency is improved owing to the elimination of duplicated program information for transmission.

[0024]

The invention recited in Claim 16 is directed to a method for preparing and transmitting program information, which is characterized by preparing and transmitting program information provided with program relation describing information for indicating that a program to be broadcasted and a program not to be broadcasted are identical. This invention has such a feature that transmission efficiency is improved owing to the elimination of duplicated program information for transmission.

[0025]

The invention recited in Claim 17 is directed to a program information receiving apparatus, which is characterized by displaying a program guide which indicates that a program to be broadcasted and a program not to be broadcasted are identical. This invention has such a feature that a program guide becomes easy to understand owing to the indication of identical programs as one.

[0026]

The invention recited in Claim 18 is directed to a program information preparing and transmitting apparatus, which is characterized by having an arrangement wherein program information which is added to information of a virtual program not to be broadcasted, for referring to program information of a program to be broadcasted, is prepared and transmitted by a program information preparing unit. This invention has such a feature that transmission efficiency is improved owing to the elimination of duplicated program information for transmission.

[0027]

The invention recited in Claim 19 is directed to a program information receiving apparatus, which is characterized by inputting program information which is added to information of a virtual program not to be broadcasted, for referring to program information of a program to be broadcasted, thereby visually expressing identity between a program not on air and a program referred to. This invention has such a feature that program selection from a program guide becomes easy owing to the indication of identical programs by only one selection of any one of the identical programs in case where channels are distantly laid out on the program guide.

[0028]

The invention recited in Claim 20 is directed to a program information

receiving apparatus, which is characterized by arranging such that program information which is added to information of a virtual program not to be broadcasted, for referring to program information of a program to be broadcasted, is inputted, thereby indicating in a column of programs not on air all or a portion of program information of a program to be broadcasted, to which the programs refer, and with selection of any of said programs from a program guide, visual indication is made such that a program to be actually broadcasted and all programs referring thereto which are not to be broadcasted have been selected. This invention has such a feature that program selection from a program guide becomes easy owing to the indication of identical programs by only one selection of any one of the identical programs in case where channels are distantly laid out on the program guide.

[0029]

The invention recited in Claim 21 is directed to a program information preparing and transmitting apparatus, which is characterized by arranging such that program information for giving a program transmission bandwidth to program information is prepared and transmitted by a program information preparing unit. This invention has such a feature that program information provided with a transmission bandwidth can be transmitted.

[0030]

The invention recited in Claim 22 is directed to a program information receiving apparatus characterized by having an arrangement wherein program qualities provided to program information for each program are indicated in a visually expressed program guide. This invention has such a feature that program selection by a viewer becomes easy because qualities are recognized at a glance.

[0031]

The invention recited in Claim 23 is directed to program information preparing and transmitting apparatus, which is characterized by arranging such that program information provided with broadcast enterprisers, time and transmission bandwidths is prepared and transmitted by a program information preparing unit. This invention has such a feature that program information for allowing a receiving terminal to prepare a three-dimensional program guide can be transmitted.

[0032]

The invention recited in Claim 24 is directed to a program information receiving apparatus, which is characterized by arranging such that a program guide is three dimensionally displayed by use of broadcast enterprisers, time and transmission bandwidths. This invention has such a feature that presence of a plurality of broadcast enterprisers can be recognized at a glance.

[0033]

The invention recited in Claim 25 is directed to a program information receiving apparatus, which is characterized by arranging such that in case where a program to be selected is switched to by selection with a program selecting means, the switching is not made on a subsequent program without selection of the program to be switched to provided that a program to be switched to refers to program information of the same program as one before the switching or refers to program information of the program before the switching, or a program before the switching refers to program information of a program to be switched to. This invention has such a feature that a viewer can avoid watching the same pictures for a number of times.

[0034]

The invention recited in Claim 26 is directed to a program information receiving apparatus according to Claim 25, characterized by arranging such that upon switching over of a viewing service, in case where a program of a service after the switching refers to program information of other program, service identification information of a service after the switching and service identification information of a service that broadcasts a program referring to the same program as said program referred to, are displayed, or in case where a program of a service after the switching is referred to by other program, service identification information of a service after the switching and service identification information of a service that broadcasts a program referring to the program of the service after the switching are displayed.

[0035]

The invention recited in Claim 27 is directed to a program information preparing and transmitting unit characterized by transmitting program information in which services or programs are hierarchically described. This invention has such a feature that program information of the hierarchical description can be transmitted.

[0036]

The invention recited in Claim 28 is directed to a method for preparing and transmitting program information, which is characterized by transmitting program information in which services or programs are hierarchically described. This invention has such a feature that program information of hierarchical description can be transmitted.

[0037]

The invention recited in Claim 29 is directed to a program information receiving apparatus characterized by displaying a program guide in which services or programs are hierarchically indicated. This invention has such a feature that a

program guide in which services or programs are hierarchically described can be displayed.

[0038]

The invention recited in Claim 30 is directed to a program information preparing and transmitting apparatus, characterized by arranging such that in case where a plurality of programs are broadcasted at the same time, program information in which services or programs that belong to the services are hierarchically described is prepared and transmitted by use of a program information preparing unit by defining one virtual service or program and describing the plural services or a portion or all of a program as one group in program information of the virtual service or program. This invention has such a feature that in case where many services are present, program information of a hierarchical description of a program can be transmitted.

[0039]

The invention recited in Claim 31 is directed to a program information preparing and transmitting apparatus according to Claim 30, characterized by arranging such that only information on superordinate services or programs of hierarchical description is transmitted to all transport streams, and program information on sub-services are transmitted only to transport streams for actual transmission of sub-services. This invention has such a feature that services and sub-services can be separately transmitted.

[0040]

The invention recited in Claim 32 is directed to a program information preparing and transmitting unit according to Claim 31, characterized by arranging such that program information on the sub-services is transmitted only to transport streams for transmission of services presented by a broadcast enterpriser that presents the sub-services. This invention has such a feature that an individual program guide including all sub-services can be displayed in a transport stream through which a particular broadcast enterpriser presents services.

[0041]

The invention recited in Claim 33 is directed to a program information receiving apparatus, characterized by arranging such that program information prepared and transmitted by the program information preparing and transmitting apparatus recited in Claim 30 is received for separately displaying program guides for main services and sub-services, and upon selection of a main service or one of the programs that belongs to the main service from the displayed program guides, a sub-service program guide of a lower hierarchy is displayed. This invention has such a feature that in case many services are present, a program guide is likely to be

easily viewable, and selection of stations and programs by a viewer is facilitated.

[0042]

The invention recited in Claim 34 is directed to a program information preparing and transmitting apparatus, characterized in that a service program correspondence table for providing program information with specification of a sub-service to be initially selected upon selection of a main service or one of the programs that belongs to the main service, is prepared and transmitted by use of a program information preparing unit. This invention has such a feature that an initially selected sub-service upon selection of a main service can be specified in the program information by a broadcast enterpriser.

[0043]

The invention recited in Claim 35 is directed to a program information receiving apparatus, characterized by arranging such that a specified sub-service is selected upon selection of a main service. This invention has such a feature that an advertisement effect can be given because a broadcast enterpriser allows a program to be specified and selected.

[0044]

The invention recited in Claim 36 is directed to a program information preparing and transmitting apparatus, characterized in that a service program correspondence table for imparting, to program information, a viewer's attribute capable of selection to sub-services is prepared and transmitted by use of a program information preparing unit. This invention has such a feature that a viewer's attribute capable of selection to sub-services can be given to program information for transmission.

[0045]

The invention recited in Claim 37 is directed to a program information receiving apparatus, characterized by arranging such that when a main service or one of the programs that belongs to the main service is selected, comparison is made between a viewer's attribute and a viewer's attribute capable of service selection that has been given to program information, thereby permitting a matched sub-service to be selected from among the sub-services included in the main service. This invention has such a feature that a service that is in coincidence with a viewer's attribute can be automatically selected.

[0046]

The invention recited in Claim 38 is directed to a program information preparing and transmitting apparatus, characterized in that a service program correspondence table for providing program information with a sub-service genre is prepared and transmitted by use of a program information preparing unit. This

invention has such a feature that a bus-service genre can be given to program information for transmission.

[0047]

The invention recited in Claim 39 is directed to a program information receiving apparatus, characterized by arranging such that when a main service or one of the programs that belongs to the main services is selected, comparison is made between a genre preset by a viewer and a sub-service genre that has been given to program information, thereby permitting a matched sub-service to be selected from among the sub-services included in the main service. This invention has such a feature that a service that coincides with a viewer's preference can be automatically selected.

[0048]

The embodiments of the invention is described hereinafter with reference to the drawings.

[0049]

(First Embodiment)

Fig. 1 shows an entire configuration of a central broadcasting station according to a first embodiment of the invention. As shown in Fig. 1, a program information preparing unit (which corresponds to an EPG preparing and transmitting apparatus of prior art) 1 prepares actual/other program information for every service based on program information detail-setting information 4 and enterpriser service correspondence information 5. It should be noted that by "actual" used herein is meant a transport stream (TS) in which the services provided by a broadcast enterpriser are actually broadcasted, and by "other" used herein is meant a TS in which the services provided by a broadcast enterpriser are not broadcasted.

[0050]

The program information detail-setting information 4 is set in such a way that the program information preparing unit 1 can control "addition/non-addition" of program information item by specifying in advance "brief/detail" for every service on the basis of a degree 5 in detail of program information. Examples of information to be set are provided below.

Example of the program information detail 5:

Service 100 → for one day, brief

Service 101 → for seven days, detail, in series

Setting by "actual" and "other" in different ways may also be possible as follows.

[0051]

Example of the program information detail 5:

Service 100 → other: for one day, brief

actual: for seven days, detail

Service 101 → other: for one day, brief

actual: for fourteen days, detail, in series

The program information preparing unit 1 prepares individual tables of an SDT (Service Description Table) and an EIT (Event Information Table) according to the program information detail-setting information 4, and also determines whether or not the tables regarding a series of program should be/should not be transmitted. For instance, in the case where a detail is as shown by 1 5 in the figure, tables as shown in Fig. 2 (SDT and EIT of "actual") and in Fig. 3 (SDT and EIT of "other") regarding service 100, are prepared. Likewise, tables of SDT and EIT of "actual" and SDT and EIT of "other", which are not shown, are prepared regarding service 101.

[0052]

The program information preparing unit 1 also prepares information on transmission target according to enterpriser service correspondence information 7 in program scheduling information 6. The enterpriser service correspondence information 7 describes that "The service 100 is transmitted through a TS1, and the service 101 is transmitted through a TS10". Thus the transmission target information are as follows.

SDT and EIT of the "actual" service 100: TS1

SDT and EIT of the "other" service 100: other than TS1

SDT and EIT of the "actual service 101: TS10

SDT and EIT of the "other" service 101: other than TS10

The program information preparing unit 1 outputs the program information and the transmission target information to a program information transmitting unit 2. The program information transmitting unit 2 subsequently outputs the pieces of information to a corresponding TS in accordance with the transmission target information. In this manner, detailed program information is transmitted to a TS through which services of a broadcast enterpriser who is providing a service are broadcasted, and brief program information is transmitted to a TS through which no service is broadcasted. Thus by tuning to any of all the TSs, a common program guide including brief program information of the individual broadcast enterprisers can be realized, and by tuning to a TS which actually carries the services on air, detailed program information (an individual program guide) of the services in the TS can be realized. The example set forth above shows the case where a single broadcast enterpriser provides a single service, but in case the following description is given, for instance, in the enterpriser service correspondence information 7 shown

in Fig. 1;

Fujisan: Service 100 (TS1) and service 102 (TS3)

Japan TV: Service 101 (TS10)

the information is transmitted in the following way:

SDT and EIT of the "actual" service 100: TS1 and TS3

SDT and EIT of the "other" service 100: other than TS1 and TS3

SDT and EIT of the "actual" service 101: TS10

SDT and EIT of the "other" service 101: other than TS10

SDT and EIT of the "actual" service 102: TS1 and TS3

SDT and EIT of the "other" service 102: other than TS1 and TS3

[0053]

In the explanation set forth hereinabove, a detail of program information has been specified for every service based on the program information detail 5, however, such detail may be realized by switching between "addition/non-addition" in the program scheduling information 6.

[0054]

Thus, a common program guide can be prepared, as shown in Fig. 32, by putting together program information pieces of all stations of "other" level (briefly covering 1 day, for instance), which are carried in the individual TSs.

Also, an individual program guide can be prepared, as shown in Fig. 32, by putting together the "actual" level program information pieces (covering in detail for 7 days, for instance, the information on only the services that belong to a bouquet which contains services carried in the TS) of each broadcast enterpriser, which are transmitted to the individual TSs.

[0055]

(Second Embodiment)

Fig. 4 shows an entire configuration of a central broadcasting station according to a second embodiment of the invention. A program information preparing unit of the second embodiment corresponds to the one which has been obtained by breaking up the program information preparing unit of the first embodiment set forth above for arranging a system.

[0056]

In Fig. 4, a program information preparing unit 1 is given to each broadcast enterpriser, and each program information preparing unit 1 prepares "actual/other" program information (the meaning of the "actual/other" is the same as in the explanation of the embodiment 1 set forth above) on the basis of a program schedule of its own station, and transmits the same to a program information multiplexing unit 2'.

[0057]

The program information multiplexing unit 2' retains the enterpriser service correspondence information 7 of Fig. 1, and referring thereto, multiplies the information as an appropriate TS ("actual" is a TS in which services provided by the same broadcast enterpriser as the one who is providing services, are broadcasted, and "other" is a TS in which services provided by the same broadcast enterpriser as the one who is providing services, are not broadcasted), for transmission toward a multiplexing and modulating unit 3.

[0058]

In this embodiment, each of the broadcast enterprisers is able to prepare program information without being influenced by the changes of the operation procedure or programming of other broadcast enterprisers. Further, the contents of program information can be set meticulously, beyond a mere detail, for each broadcast enterpriser.

[0059]

(Third Embodiment)

Fig. 5 shows an entire configuration of a central broadcasting station according to a third embodiment of the invention. A program information preparing unit of the third embodiment basically has the same arrangement as the program information preparing unit of the embodiment 2.

[0060]

The program information preparing unit of the third embodiment is further provided with a program information preparing unit 1' for preparing a common portion (common program information) of program information which each broadcast enterpriser wants to prepare. As a result, each broadcast enterpriser is released from the necessity of preparing the common portion. The common portion of the program information may include common tables in the network, for instance, NIT (which indicates information for tuning to a TS included in the network, a network name or the like) or BAT (which indicates a list of services provided by a broadcast enterpriser and TS that carries the services, a bouquet name or the like).

[0061]

A program information multiplexing unit 2' multiplexes the program information and the common program information prepared by each of the broadcast enterprisers, for transmission to a multiplexing and demodulating unit 3.

[0062]

Thus, the present embodiment dispenses with the necessity of preparing the common portion of the common program information by each broadcast enterpriser, thereby reducing labor by each broadcast enterpriser. Further, NIT or BAT which

is the common table in a network, is very unlikely to be changed, and thus can be prepared at a single section to avoid inconsistency. Also, time deviation in TDT (a table for indicating time of receiving transmission), which may occur if the table is prepared by each of the broadcast enterprisers, can be avoided.

[0063]

(Fourth Embodiment)

Fig. 6 shows a general arrangement of a receiving terminal device in a digital broadcast system. In the digital broadcast system, programs such as of video and audio signals, PSI (a group of tables stipulated by MPEG2), and SI (a group stipulated by DVB) are multiplexed and broadcasted through the transport stream (TS) of MPEG2. The tables of PSI and SI of the same contents are repeatedly used for broadcasting. The tables of PSI and SI are designated with version numbers, and when the contents are renewed, the version numbers are renumbered.

[0064]

The receiving terminal unit shown in Fig. 6 is constituted of an antenna 610, a display unit (TV monitor) 620, a remote control unit 630 and a broadcast receiving terminal 600. The broadcast receiving terminal 600 is constituted of a tuner 601 for tuning digital broadcast signals, a demodulator circuit 602 for demodulating the tuned digital broadcast signals, a demultiplexer 603 for separating video and audio signals from program information in the demodulated signals, an A/V decoder 604 for decoding the video and audio signals, a section decoder 605 for decoding sectional information from the program information, a memory 606, a CPU 608 for controlling the individual components of the broadcast receiving terminal 600, and an optical receiver 607 for optically receiving remote control signals from the remote control unit 630.

[0065]

When power is on, the broadcast receiving terminal 600 receives broadcast signals from a satellite (not shown) through the antenna 610, tunes up the signals with the tuner 601, and decodes with the section decoder 605 the SI (a group of tables stipulated by DVB) which is contained in a section separated by the demultiplexer 603, according to the contents carried in a TS, which have been demodulated by the demodulator circuit 602, for storage in a memory 606. Specifically, the broadcast receiving terminal 600 monitors the tables, and stores the latest SI tables in the memory 606 with reference to the version numbers. The tables include those designated with packet ID numbers or table ID numbers according to the MPEG2 or DVB, or those whose packet ID numbers are indicated in other tables. An arrangement is made such that packets are collected on the basis of the ID numbers from the TS for construction of tables, and that the kinds of tables

can be specified from the table ID numbers. Accordingly, the memory 606 constantly stores the latest tables such as NIT (Network Information Table), SDT (Service Description Table), and EIT (Event Information Table).

[0066]

Common program information, such as BAT (Bouquet Association Table, in which a bouquet name and services contained in the bouquet (of every broadcast enterpriser) are listed) which is a broadcast enterpriser service correspondence table, and individual program information such as EIT (Event Information Table) or SDT (Service Description Table) for only the services contained in the bouquet, as shown in Figs. 7 and 8, are produced and transmitted by the program information producing and transmitting apparatus of the central station as explained in the first embodiment set forth above. PAT (program Association Table), PMT (Program Map Table) and ES (Elementary Stream) shown in Fig. 7 are stipulated by the MPEG2. Accordingly, the transport stream (TS) results in as shown in Fig. 9.

[0067]

The broadcast receiving terminal 600, shown in Fig. 6, which has received pieces of program information (group of tables) prepares the individual program guides through the following procedure.

[0068]

① To receive BAT first with the CPU 608 in the broadcast receiving terminal 600.

[0069]

② To obtain all service numbers of a bouquet which includes a currently viewed service number.

[0070]

③ To prepare, with CPU 608, an individual program guide on the basis of the program information concerning the service of a given service number, SDT and EIT for indication on a monitor 620.

[0071]

Fig. 10 shows a frame format of an individual program guide displayed on a TV screen in case a viewer selects a channel B through the above procedure. A service name is obtained from SDT, and a program name, showtime of the program, length of the program, and the like are obtained from EIT, and displayed.

[0072]

The present embodiment, in which the individual program information is broadcasted, is realized by receiving signals thereof. However, the program information may be transmitted through another network such as a telephone circuit, and may be inputted through a storage medium such as DVD or FD.

[0073]

In this way, according to the fourth embodiment of the invention, the individual program guides of each broadcast enterpriser can be displayed only on an occasion when a service of the broadcast enterpriser is viewed. For this reason, it becomes possible to avoid such a trouble between broadcast enterprisers that, during reception of a service of one broadcast enterpriser, a program guide of another broadcast enterpriser is displayed to interrupt reception of the service of the former.

[0074]

(Fifth Embodiment)

A fifth embodiment of the invention is constituted such that, when a bouquet is selected, a broadcast receiving terminal automatically selects one particular service. Fig. 11 shows BAT (Bouquet Association Table), which is a broadcast enterpriser service correspondence table, for explaining the fifth embodiment of the invention. In Fig. 11, BAT, which is a broadcast enterpriser service correspondence table, is attached with default selection flags. For instance, in case a viewer selects a station A, a service designated with a service ID 1 whose default selection flag is shown as "○", is selected.

[0075]

Further, in case a viewer selects a station B, a service designated with a service ID 4 whose default selection flag is shown as "○", is selected.

[0076]

Although Fig. 11 shows a case where the default selection flag is attached to BAT, which is a broadcast enterpriser service correspondence table, such a default selection flag may be attached to SDT, shown in Fig. 8, which is a transport stream service correspondence table. As a result, TV screen turns out to be as shown in the schematic view of Fig. 12. Specifically, if "Japan TV" is selected during "Fujisan" is viewed, the service (channel) of service ID 1 specified by "Japan TV" is automatically selected on the screen upon switching to "Japan TV".

[0077]

Thus, according to the fifth embodiment of the invention, an initially displayed channel can be specified by a broadcast enterpriser, and under the condition of which, an energetically provided channel can be placed in a watch, and thus the embodiment can be effectively utilized such as for advertisement.

[0078]

(Sixth Embodiment)

A sixth embodiment of the invention is constituted such that a viewer's attribute is provided, instead of a default selection flag. More particularly, the sixth embodiment is constituted such that, when a bouquet (broadcast enterpriser)

is selected, the CPU 608 of the broadcast receiving terminal compares a viewer's attribute which has been preset in the memory 606 or inputted from outside, with a viewer's attribute, i.e. a viewer's tendency of viewing programs, attached to a received table, and selects a service matched.

[0079]

Thus, according to the sixth embodiment of the invention, a program which matches with a viewer's preference can be automatically selected from a broadcast program guide inherent to the broadcast enterpriser.

[0080]

(Seventh Embodiment)

A seventh embodiment of the invention is constituted such that a service genre is provided, instead of the default selection flag. More specifically, the seventh embodiment is constituted such that the CPU 608 of the broadcast receiving terminal selects a service that matches a service genre of a viewer's preference which has been preset in the memory 606 or inputted from outside or determined on the basis of a viewing history. As a result, the TV screen turns out to be as shown in the schematic view of Fig. 12. In other words, when "Japan TV" is selected during "Fujisan" is viewed, the service (channel) of service ID 1 specified by "Japan TV" is automatically selected on the screen upon switching to "Japan TV".

[0081]

Thus, according to the seventh embodiment of the invention, a program that matches with a viewer's preference can be automatically selected from a program guide inherent to the broadcast enterpriser.

[0082]

(Eighth Embodiment)

Before describing the present embodiment, a background thereof is described. For better understanding, a case is provided where, after performing standard programs of three channels, a high-definition television (HDTV) program of one channel, which mostly extends over three-channel transmission band, is performed, and the standard programs are no longer performed. Under the circumstances, a program guide indicates that any of the three channels transmits high-definition television (HDTV). However, such a transmission of a single piece of program information extending over three channels results in inefficient use of the transmission band.

[0083]

In this connection, in the eighth embodiment of the invention, the program information preparing and transmitting apparatus of the central station describes program information using three bands only in the program information of a certain

channel program, and as to programs of other channels, describes in EIT (Event Information Table) to refer to channel information that describes program information. Specifically, as shown in Fig. 13, this embodiment is constituted such that an EIT (Event Information Table) attached with event link (event link) information is prepared in the program information preparing and transmitting apparatus of the central station, in such a manner that, for instance, "Refer to service 6, event 40 of TS30" is provided in the event link (event link) information columns of service ID 7 and service ID 8, and that, in case event link information is provided to an EIT, the event is indicated in a program guide, or in case specified in a program guide, the event information of the link target is subjected to processing. It should be noted that an "event" is a term derived from DVB (European digital broadcasting standards), and has the same meaning as program.

[0084]

When the EIT as mentioned above is received by the broadcast receiving terminal 600, the CPU 608 of the receiving terminal obtains a broadcasting schedule from the EIT, and where event link information exists, recognizes the programs to be identical, and proceeds to preparing a program guide. Also, in case the above-mentioned event is specified in a program guide by the remote control unit 603, the event information of the link target is selected to be a subject of processing.

[0085]

Although programs identity is preliminarily informed by event link information in the present embodiment, the embodiment may also be realized such as by separately preparing information on identical program groups.

[0086]

In this way, duplication of program information to be transmitted can be eliminated in the eighth embodiment of the invention, thereby improving a transmission efficiency.

[0087]

(Ninth Embodiment)

As is illustrated in the eighth embodiment set out above, with the EIT, the programs of services (channels) 7, 8 are provided with event link information directed to the program of a service (channel) 6 (refer to Fig. 13). In this connection, in a ninth embodiment of the invention, when such an EIT is received by the broadcast receiving terminal 600, the CPU 608 of the receiving terminal obtains a broadcasting schedule of the program from the EIT as shown in Fig. 14, and where event information of the link target exists, a program guide is prepared using link target information as an object to be processed.. More specifically, as the services (channels) 7, 8 are linked to the service (channel) 6 in terms of event link

information, the services 6, 7 and 8 can be recognized to be identical, and three services (channels) 6-8 are displayed on a program guide as linked. As a result, "HDTV" is displayed as linked in the course of 4 o'clock and 5 o'clock. After all, a "mottling" pattern appears on the TV screen.

[0088]

In the present embodiment, program identity is preliminarily informed by the event link information, but the embodiment can also be realized such as by separately preparing identical program groups information.

[0089]

Thus, in the ninth embodiment of the invention, identical programs are described as one, thereby making the program guide easy to understand.

[0090]

(Tenth Embodiment)

A tenth embodiment of the invention is constituted such that, in case an EIT prepared by the program information preparing and transmitting apparatus of the central station, is provided with event link information so that programs in the hours of 16:00 o'clock and 17:00 o'clock of services (channels) 1, 2, 4 refer to the same programs (entity of program information may be described in any one of the services), upon viewer's selection of a program of any of the services (channels) 1, 2, 4, as shown in Fig. 15, all the programs turn out as having been selected on the program guide displayed on the TV screen.

[0091]

It should be noted that although in the present embodiment, program identity is preliminarily informed by the event link information, the embodiment can also be realized such as by separately preparing identical program groups information.

[0092]

As described above, with the tenth embodiment of the invention, identical programs are displayed only by selecting any one of the identical programs in a condition where channels are distantly laid out in a program guide, which facilitates selection of programs in a "mottling" pattern program guide. Specifically, as identical programs are indicated as one, the program guide becomes easy to understand.

[0093]

(Eleventh Embodiment)

An eleventh embodiment of the invention is contemplated such that, as shown in Fig. 16, an EIT (Event Information Table) in which bandwidth information is provided to each program, is prepared and transmitted by the program

information preparing and transmitting apparatus in the central station.

[0094]

A broadcast receiving apparatus receives the EIT as mentioned above and sets a program width of a program guide to be displayed on a TV screen based on the bandwidth information. As a result, the program guide that is displayed on the TV screen turns out as shown in Fig. 17. Specifically, it is so design that the display width of a program is in proportion to the bandwidth.

[0095]

Further, a program guide may be displayed by giving bandwidth information for each channel (service) to an SDT (Service Description Table). In this case, the program guide is as illustrated in Fig. 18, in which display width differs by every channel (service).

[0096]

Furthermore, the bandwidth information which the AV decoder 604 obtains from AV information of each program may be used. Although the present embodiment indicates qualities by displaying bandwidth information in terms of a display width, the qualities can also be indicated by displaying the bandwidth information in terms of a kind of service, i.e. color, mark such as icon, or the like other than the display width. Also, kinds of services may be described in an SDT, while broadcasting in advance a contrast table (refer to Fig. 19) between kinds of services and display widths, or storing the same in the memory 606 of the broadcast receiving terminal 600, thereby displaying every channel, with its display width on a program guide being adjusted by obtaining a display width ratio from the contrast table depending on the kinds of services.

[0097]

In this way, in the eleventh embodiment of the invention, qualities can be visually recognized by varying the manner of indication of a program guide in accordance with a bandwidth which is required upon transmitting service data, thereby facilitating selection of programs by a viewer.

[0098]

(Twelfth Embodiment)

A twelfth embodiment of the invention shown in Fig. 20, is so contemplated as to display a program guide in a three-dimensional manner in terms of broadcast enterpriser, time and transmission bandwidth. It is also possible to display program promotion at the side face of the three-dimensionally displayed block.

[0099]

In addition, it is also possible to bring frontward, for instance, a program guide of a broadcast enterpriser station B, or to change a channel which is to be

brought to the right end (where the promotion is displayed) within a broadcast enterpriser station A, according to a viewer's selection. Specifically, the CPU 608 in a broadcast receiving terminal apparatus can realize the display as set forth above by performing program control, based on the information on the broadcast enterpriser, time and transmission bandwidth, which is transmitted in the form of a table.

[0100]

Thus, in addition to the effects of the eleventh embodiment, the twelfth embodiment of the invention allows a viewer to visually recognize the presence of a plurality of broadcast enterprisers. Moreover, it is also possible to display a promotion image or the like while making use of the three dimensions.

[0101]

(Thirteenth Embodiment)

In a thirteenth embodiment of the invention, when a channel is shifted by turns from 1, as shown in Fig. 21(a), in the course of 4 o'clock by operating an arrow key or the like of the remote control unit 630 in a broadcast receiving terminal apparatus for displaying program guides obtained through the ninth embodiment set forth above, programs are displayed, as shown in Fig. 21(b), on a TV screen or on a channel display (not shown) of a broadcast receiving terminal in the order of channel 1 (program 100) → channel 2 (program 105) → channel 5 (program 104), skipping tuning operation of channels 3, 4, so that identical programs are displayed only once, whereas channels have been conventionally selected in the order of channel 1 (program 100) → channel 2 (program 101) → channel 3 (program 102) → channel 4 (program 103) → channel 5 (program 104), in which the same program is continuously displayed on a screen.

[0102]

Thus, the thirteenth embodiment of the invention releases a viewer from watching the same image many times.

[0103]

(Fourteenth Embodiment)

In a fourteenth embodiment of the invention, when a channel is shifted by turns from 1, as shown in Fig. 21(a), in the hour of 4 o'clock by operating an arrow key or the like of the remote control unit 630 in a broadcast receiving terminal apparatus for displaying program guides obtained through the ninth embodiment set forth above, programs are displayed, as shown in Fig. 21(c), on a TV screen or on a channel display (not shown) of a broadcast receiving terminal in the order of channel 1 (program 100) → channels 2, 3, 4 (program 105) → channel 5 (program 104), whereas conventionally, channels have been selected in the order of channel 1

(program 100) → channel 2 (program 101) → channel 3 (program 102) → channel 4 (program 103) → channel 5 (program 104), in which the same program is continuously displayed on a screen.

[0104]

The same is applied to the case where a channel is directly specified. (When any of channels 2, 3, 4 is specified, "2, 3, 4" is displayed on a screen.)

In the present embodiment, a channel program has been utilized as service identification information, but a service name, a service logo or the like can also be displayed in terms of the service identification information.

[0105]

Thus, with the fourteenth embodiment of the invention, a problem that the service numbers on display are scattered and are thus unlikely to understand can be overcome.

[0106]

(Fifteenth Embodiment)

Assumption is made now that actual services are arranged as shown in Fig. 22. In this instance, services represented by service IDs 101, 103 are transmitted to a TS of TS-ID 3, and those represented by service IDs 900-903 are transmitted to a TS of TS-ID 5 as shown in Fig 23. The services of the service IDs 900-903 are the sub-services of the service ID 103, and the service of the service ID 103, for instance, is a promotion service such as of a music program.

[0107]

In this connection, a fifteenth embodiment of the invention is contemplated to describe, for instance, SDTs as shown in Figs. 24, 25 and EITs as shown in Figs. 26, 27 and 28 in the program information preparing and transmitting apparatus of the central station in case music 1 (service ID: 900), music 2 (service ID: 901), music 3 (service ID: 902), and music 4 (service ID: 903) from 12 o'clock are desired to be grouped as "music" of the service ID: 103.

[0108]

Specifically, Fig. 24 relates only to main services (superordinate services) in respect of the service IDs 101, 103, and Fig. 25 relates to main services and sub-services in respect of the service IDs 101, 103 and the service IDs 900-903, respectively.

[0109]

Fig. 26 shows an EIT concerning the service of the service ID 101. Fig. 27 shows an EIT concerning the service of the service ID number 103. Further, Fig. 28 shows an EIT concerning the services of the service IDs 900-903.

[0110]

Thus, the fifteenth embodiment of the invention is constituted such that programs can be described in hierarchy. In the fifteenth embodiment of the invention, programs are hierarchically described, but this hierarchical description is not limited to programs, but services can also be hierarchized.

[0111]

In this way, with the fifteenth embodiment of the invention, a program guide can be made easy to see in case a number of services are present, which contributes to easy tuning and program selection by a viewer.

[0112]

(Sixteenth Embodiment)

A sixteenth embodiment of the invention relates to a method for transmitting the various tables in Fig. 24 to 28 as mentioned above in the program information preparing and transmitting apparatus of the central station. Specifically, the sixteenth embodiment of the invention is constituted such that program information on main services is transmitted to all the TSs, and program information on sub-services is transmitted only to the TSs in which the sub-services are actually carried, in the information preparing and transmitting apparatus of the central station. It should be noted that correspondence between TSs and services are inputted in advance.

[0113]

In the present embodiment, the SDT (Service Description Table) of Fig. 24 and the EITs (Event Information Tables) of Figs. 26 and 27 are carried in the ST of TS-ID 3, and the SDT (Service Description Table) of Fig. 25 and the EIT (Event Information Table) of Fig. 28 are carried in the ST of ST-ID 5. Accordingly, the transmission images of the services and information become as shown in Figs. 23 and 29.

[0114]

Thus, with the sixteenth embodiment of the invention, it is possible to display main services (superordinate services) as a common program guide, and sub-services (subordinate services), as an individual program guide.

[0115]

(Seventeenth Embodiment)

The sixteenth embodiment set forth above has been the one wherein program information of sub-services are fed only to the TSs to which services are actually transmitted, but a seventeenth embodiment of the invention is constituted such that the sub-services program information is fed only to the TSs containing services of one particular broadcast enterpriser.

[0116]

Specifically, as shown in Fig. 30, where a broadcast enterpriser A presents services marked with a black star, i.e., the service IDs 101, 103, the sub-services 900, 901, 902, 903 of the service ID 103, and the service ID 105, and where a broadcast enterpriser B presents services marked with a black rectangle, i.e., the service ID 106; program information of services represented by the service IDs 101, 103, 105, 106 is transmitted to all the TSs, and program information of the service IDs 900-903 is fed to the TSs represented by TS-IDs 3, 5, 6 to which those services presented by the broadcast enterpriser A are transmitted, and not fed to the TS represented by TS-ID 7 to which those services presented by the broadcast enterpriser B are transmitted. It should be noted that the information on correspondency between the enterprisers and services is inputted in advance.

[0117]

Thus, with the seventeenth embodiment of the invention, it is possible to display an individual program guide including all the sub-services in a transport stream (TS) which carries the services presented by the broadcast enterpriser A.

[0118]

(Eighteenth Embodiment)

An eighteenth embodiment of the invention relates to a method for displaying a program guide at a broadcast receiving terminal that has received program information. As described in the fourth embodiment set forth above, the CPU 608 of the broadcast receiving terminal that has received program information prepares and displays a program guide as shown in Fig. 31 with reference to an SDT (Service Description Table) and an EIT (Event Information Table).

[0119]

When a viewer selects a service or a program, in which sub-services are present, from a program guide as shown in Fig. 31(a), an indication is made as shown in Fig. 31(b) by obtaining sub-service program information from "reference services" and "reference TS-ID" in SDTs shown in Figs. 24 and 25, and obtaining sub-service program information from the EIT. It should be noted that no indication is made in the absence of sub-service in the EIT.

[0120]

Thus, with the eighteenth embodiment of the invention, programs can be made easy to see in case a number of programs are present, thereby facilitating tuning and program selection by a viewer. Further, the embodiment can cope with a case of a program of "mottling" broadcasting in which services or programs are increased for a short while.

[0121]

(Nineteenth Embodiment)

A nineteenth embodiment of the invention is contemplated that in preparing an SDT as shown in Fig. 25, a broadcast enterpriser (it may not necessarily be a broadcast enterpriser) can specify a sub-service initially selected by a broadcast receiving terminal upon viewer's selection of the main service 103. Specifically, in the like manner as described in the fifth embodiment set forth above, i.e. the manner wherein selection is made to a service whose default flag is marked with "○" in the SDT serving as a transport stream service correspondence table, the CPU 608 of the broadcast receiving terminal 600 automatically selects a sub-service whose "Selected Station" is marked with "○" from the received SDT.

[0122]

Thus, with the nineteenth embodiment of the invention, the impact of advertisement can be increased because a broadcast enterpriser can control programs to be selected.

[0123]

(Twentieth Embodiment)

A twentieth embodiment of the invention is contemplated, as shown in Fig. 25, that in preparation of an SDT by a broadcast enterpriser (it may not necessarily be a broadcast provider), a viewers' attribute of possible channel selection is given to every service. Specifically, when a viewer selects the main service 103, a broadcast receiving terminal compares the attribute of this viewer with that preset in an SDT, and selects the resulting sub-service. For instance, in case a viewer who has selected a main service represented by the service ID 103 shown in Fig. 24, is at the age of 65 and has a domicile in Tokai district, a sub-service represented by a service ID 902 is selected from the SDT (Service Description Table) of Fig. 25.

[0124]

Thus, the twentieth embodiment of the invention mitigates a viewer's tuning labor and enables automatic selection of a service that matches with the viewer's attribute. Moreover, this embodiment can be used for program reception control based on age limitation and district limitation.

[0125]

(Twenty-first Embodiment)

A twenty-first embodiment of the invention is contemplated, as shown in Fig. 25, that in preparation of an SDT by a broadcast enterpriser (it may not necessarily be a broadcast enterpriser), a column for indicating a service genre is given. For instance, in case a viewer is recorded "in the central station as having an interest in "movie", a sub-service represented by a service ID 900 is selected. It may be that the central unit makes a judgment as to a viewer's preference from the viewer's historical data and makes a recordation in an SDT instead of having the viewer

make a recordation in the central station in advance.

[0126]

Thus, the twenty-first embodiment of the invention mitigates a viewer's tuning labor and enables automatic selection of a service that matches with the viewer's preference.

[0127]

[Advantages of the Invention]

As described above, the present invention has such an advantage that a common program guide and an individual program guide can be realized while efficiently utilizing a bandwidth. Another advantage of the invention is that each of the broadcast enterprisers only has to prepare its own program information and is not required to prepare program information of other stations, owing to the decentralization of a program information preparing unit. Still another advantage of the invention is that each of broadcast providers is released from the necessity of preparing common portions of common program information, owing to the provision of a common program information preparing unit.

[0128]

Further, the present invention has such an advantage of avoiding troubles between broadcast enterprisers, which are caused by displaying a program guide of other broadcast enterpriser while a service of one broadcast provider is viewed, owing to the indication of an individual program guide of an individual broadcast enterpriser only during the time when a service of the broadcast enterpriser is viewed. Also, owing to the possibility of default selection, genre selection and the like, an initially displayed program can be controlled by a broadcast enterpriser, which can be effectively utilized for advertisement. In addition, a program that matches a viewer's taste can be automatically selected in a program guide original to a broadcast enterpriser.

[0129]

Furthermore, this invention has such an advantage that transmission efficiency can be improved by eliminating duplication of transmitted program information, owing to the indication of the program information in only one channel. Also, a program guide becomes easy to understand because identical programs are described as one program. In addition, this invention is advantageous in that selection of a "mottling" program on a program guide becomes easy to understand, because by selecting only one from among the identical programs, other identical programs are also shown up, even when channels are distantly laid out on the program guide.

[0130]

Still further, it is easy for a viewer to make a program selection, since qualities are visually understandable with varying indication of a program guide depending on the bandwidth which is required in transmitting service data. In addition, presence of a plurality of broadcast enterprisers becomes also visually understandable. Further, a promotion image can be shown by utilizing three-dimensional program indication.

[0131]

Moreover, it becomes possible to indicate main services (superordinate services) as a common program guide, and sub-services (subordinate services), as an individual program guide. Further, it also becomes possible to indicate an individual program guide including all sub-services in a transport stream to which services of a particular broadcast enterpriser are presented.

[0132]

Further, the impact of advertisement is increased because the broadcast enterpriser can control programs to be selected. Also, owing to such an automatic selection, a viewer is released from tuning labor. Furthermore, services of a viewer's attribute can be automatically selected. Still further, application can be made for limiting programs to be viewed, i.e. limitation such as by age or district.

[Brief Description of the Drawings]

[Fig. 1]

is a view showing a whole arrangement of a central broadcasting station of a first embodiment of the invention.

[Fig. 2]

shows contents of an SDT and an EIT ("actual") of service 100.

[Fig. 3]

shows contents of an SDT and an EIT ("other") of service 100.

[Fig. 4]

is a view showing an entire arrangement of a central broadcasting station of a second embodiment of the invention.

[Fig. 5]

is a view showing an entire arrangement of a central broadcasting station of a third embodiment of the invention.

[Fig. 6]

is a view showing an ordinary arrangement of a receiving terminal apparatus related to the invention.

[Fig. 7]

shows contents such as of a BAT or NIT related to common program information for explaining a fourth embodiment of the invention.

[Fig. 8]

shows contents such as of a BAT or NIT related to individual program information for explaining a fourth embodiment of the invention.

[Fig. 9]

is a view showing a state of transmission by a TS according to a fourth embodiment of the invention.

[Fig. 10]

is a schematic view showing an individual program guide according to a fourth embodiment of the invention, which is indicated in case a viewer selects a station B.

[Fig. 11]

is a view for illustrating default selection according to a fifth embodiment of the invention.

[Fig. 12]

is a view for illustrating genre selection according to a seventh embodiment of the invention.

[Fig. 13]

shows contents of an EIT attached with event link information according to an eighth embodiment of the invention.

[Fig. 14]

is a schematic view of a program guide indicated on a receiving terminal apparatus, based on an EIT attached with event link information according to a ninth embodiment of the invention.

[Fig. 15]

is a view illustrating a method for selecting programs according to a tenth embodiment of the invention.

[Fig. 16]

shows contents of an EIT attached with bandwidth information according to the eleventh embodiment of the invention.

[Fig. 17]

shows a display example of a program guide according to an eleventh embodiment of the invention.

[Fig. 18]

shows a display example of other program guide according to an eleventh embodiment of the invention.

[Fig. 19]

is a table showing correspondency between kinds of services and display widths for explaining an eleventh embodiment of the invention.

[Fig. 20]

shows a display example of a three-dimensional program guide in terms of a broadcast enterpriser, time and transmission bandwidth according to a twelfth embodiment of the invention.

[Fig. 21]

(a) shows an example for instructing channel switching from channel 1 in the course of 4 o'clock on a program guide.

(b) shows a display example of a channel in a thirteenth embodiment of the invention.

(c) shows a display example of a channel in a fourteenth embodiment of the invention.

[Fig. 22]

shows one specific example of a service for explaining a fifteenth embodiment of the invention.

[Fig. 23]

shows a transmission image of services and program information according to fifteenth and a sixteenth embodiments of the invention.

[Fig. 24]

shows contents of an SDT according to a fifteenth embodiment of the invention wherein main services of service IDs 101, 103 are described.

[Fig. 25]

shows contents of an SDT according to fifteenth and nineteenth to twenty-first embodiments of the invention, in which main services and sub-services of service IDs 101, 103, 900-903 are described

[Fig. 26]

shows contents of an EIT whose service ID is 101 according to the fifteenth embodiment of the invention.

[Fig. 27]

shows contents of an EIT whose service ID is 103, according to the fifteenth embodiment of the invention.

[Fig. 28]

shows descriptive contents of an EIT whose service IDs are 900 to 903 according to the fifteenth embodiment of the invention.

[Fig. 29]

shows a transmission image of services and program information related to a sixteenth embodiment of the invention.

[Fig. 30]

shows a transmission image of services and program information related to a

seventeenth embodiment of the invention.

[Fig. 31]

(a) is a view showing selection of services in a program guide in which sub-services are present.

(b) is a view showing a program guide of sub-services related to an eighteenth embodiment of the invention.

[Fig. 32]

shows examples of a common program guide and an individual program guide.

[Fig. 33]

shows an arrangement of a conventionally known, ordinary digital broadcasting system including a central broadcasting system.

[Illustration of Reference Numerals]

1 program information preparing unit

1' common program information preparing unit

2 program information transmitting unit

2' program information multiplying unit

3 multiplexer/modulator

4 program information detail degree setting information

5 program information detail degree

6 program schedule information

600 broadcast receiving terminal

601 tuner

602 demodulator circuit

603 demultiplexer

604 AV decoder

605 section decoder

606 memory

607 photo acceptance unit

608 CPU

610 antenna

620 display (TV monitor)

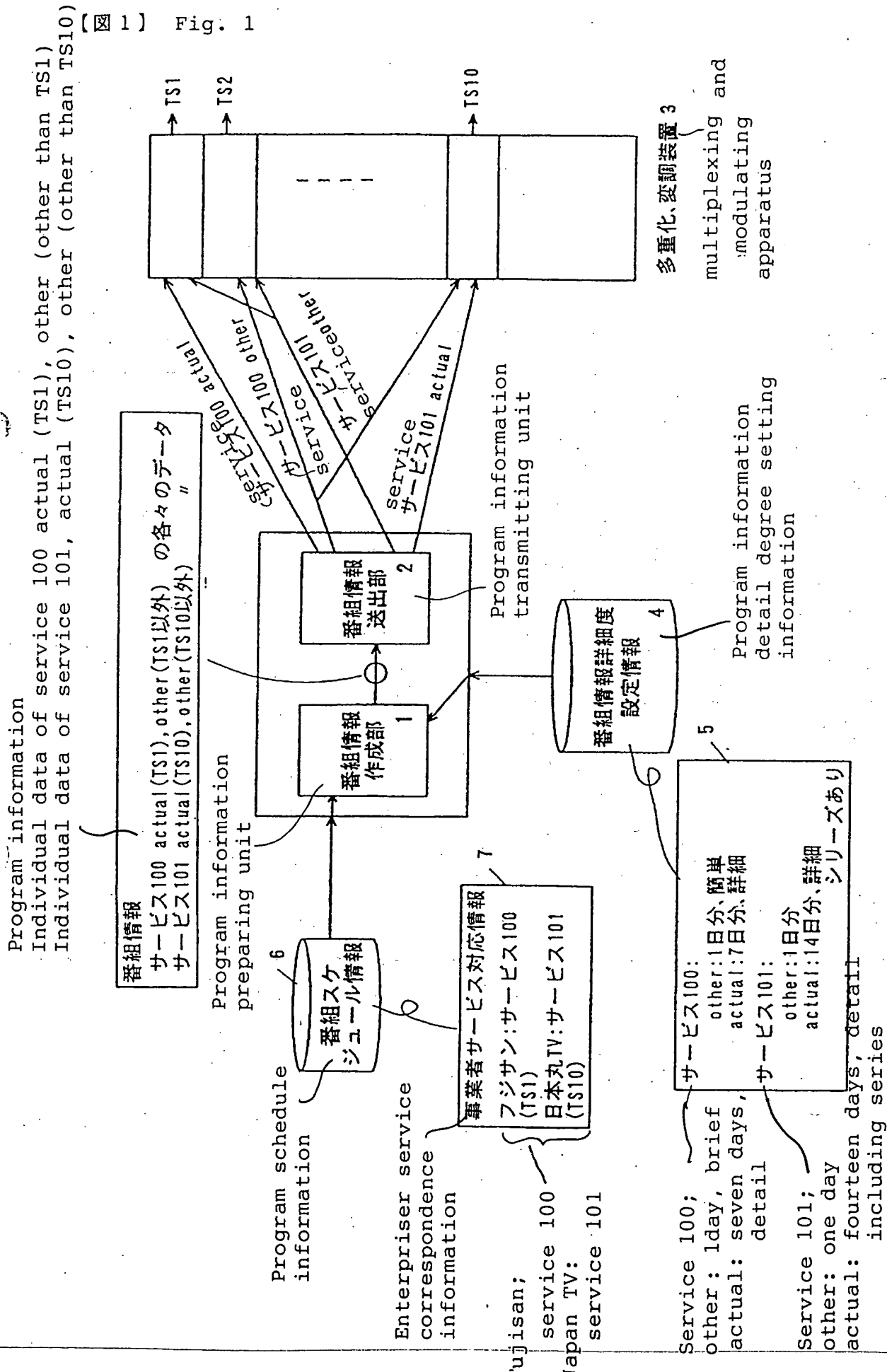
630 remote controller

【書類名】

図面

特原頁平9-352048

【図1】 Fig. 1



[Fig. 2]

SDT (detail) of "actual" of service 100

TS-ID	1
Service ID	100
Service Name	Fujisan
Kind of Services	SDTV
Broadcast Enterpriser Name	Fujisan Co., Ltd.
Location	Shizuoka-pref.

EIT (covering seven days, detail) of "actual" of service 100

Service ID	100							
TS-ID	1							
Program ID	3	4	5	---	9	10	11	12
Program Name								
Starting Time	1/1 0:00	1/1 1:00	1/1 2:00	---	1/7 22:00	1/7 23:00	1/7 23:15	1/7 23:45
Duration of Program	60	60	30	---	60	15	30	15
Cast								
Director								
Location Site								
Genre								
...								

For 7 days from 1/1 to 1/7

[Fig. 3]

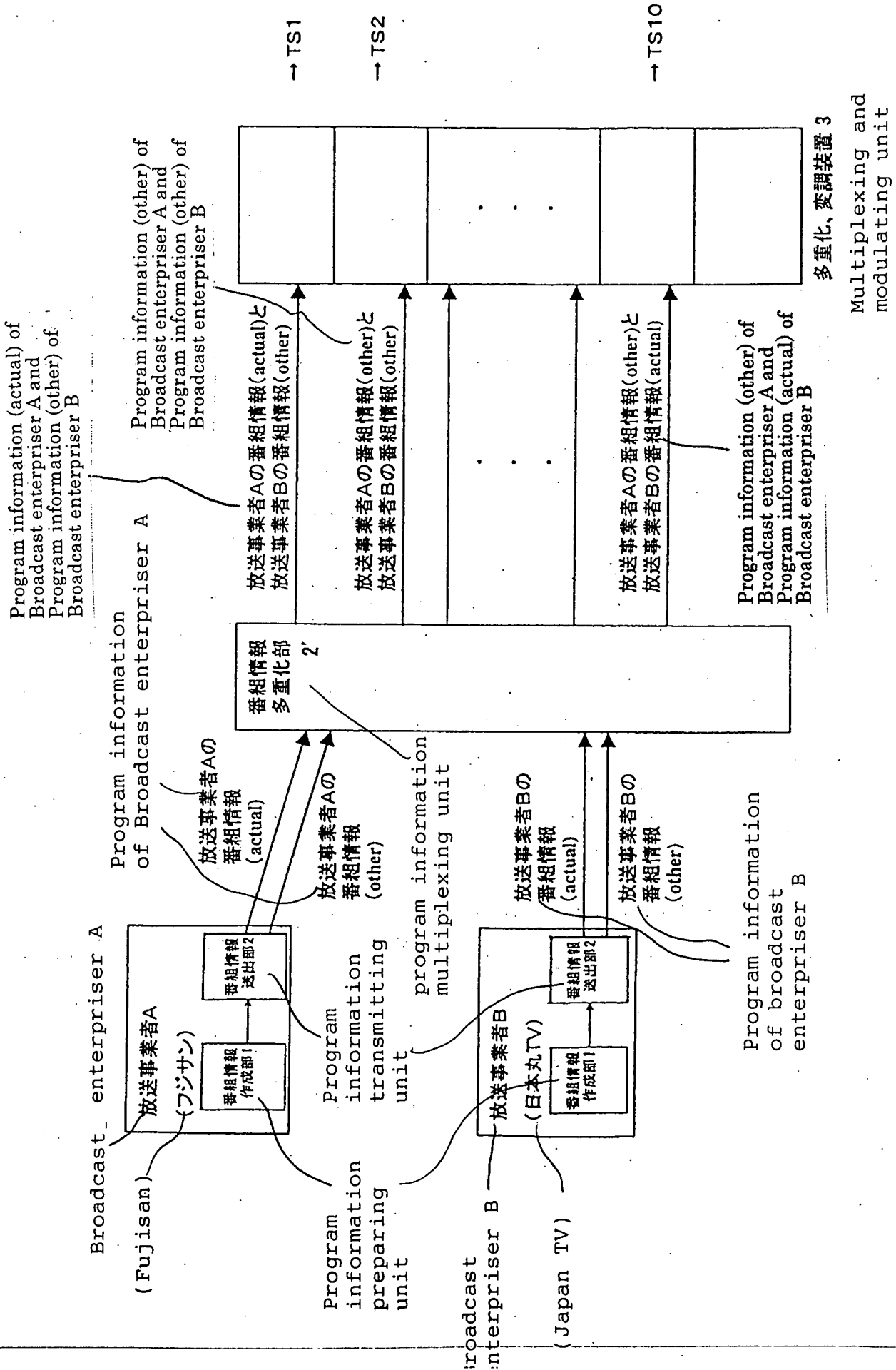
SDT (brief) of "other" of service 100

TS-ID	1
Service ID	100
Service Name	Fujisan
Service Type	SDTV

EIT (brief) of "other" of service 100

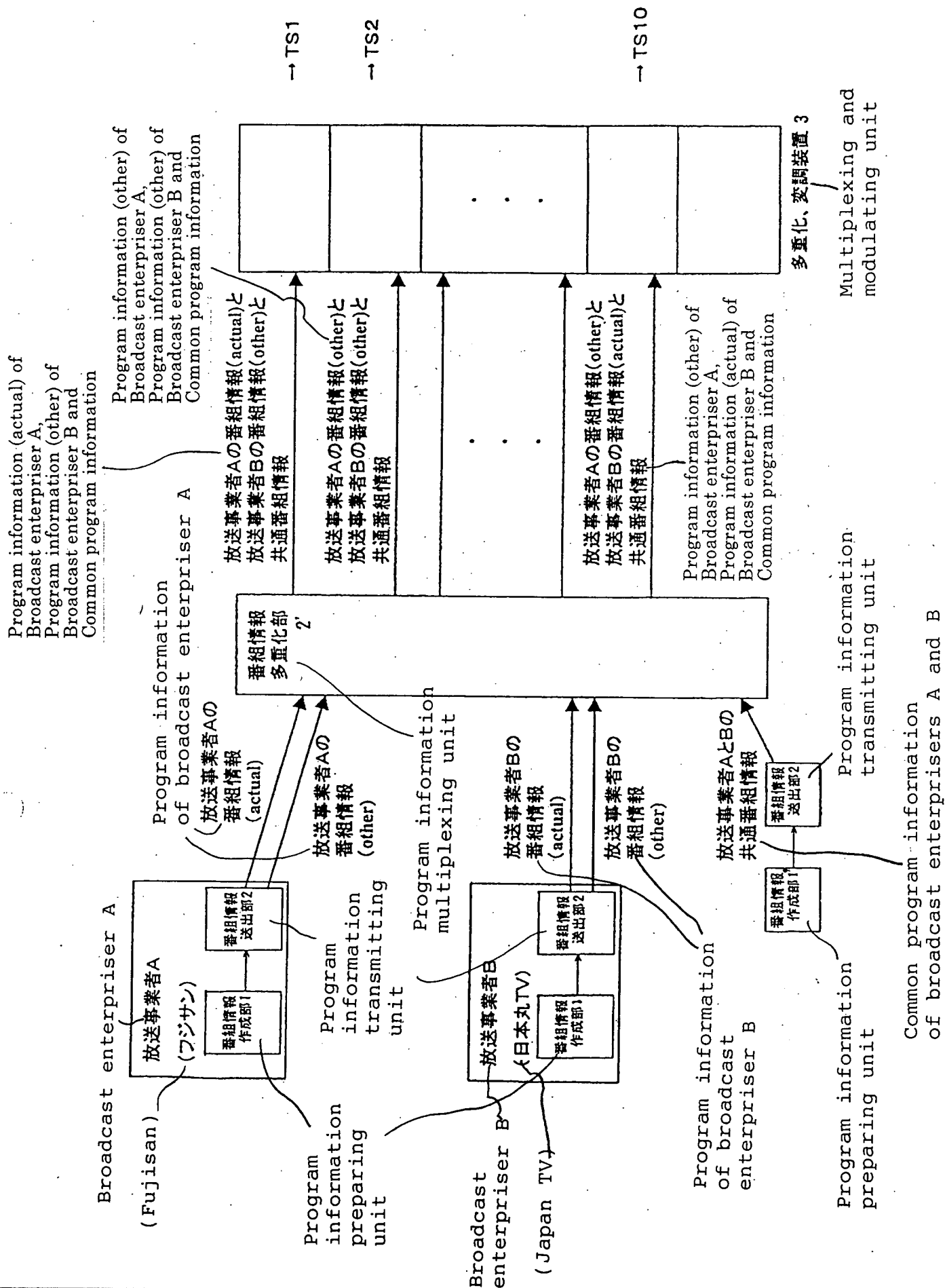
Service ID	100					
TS-ID	1					
Program ID	3	4	5	---	109	110
Program Name						
Showtime	1/1 0:00	1/1 1:00	1/1 2:00	---	1/1 23:00	1/1 23:55
Duration of Program	60	60	30	---	5	5

【図4】 Fig. 4

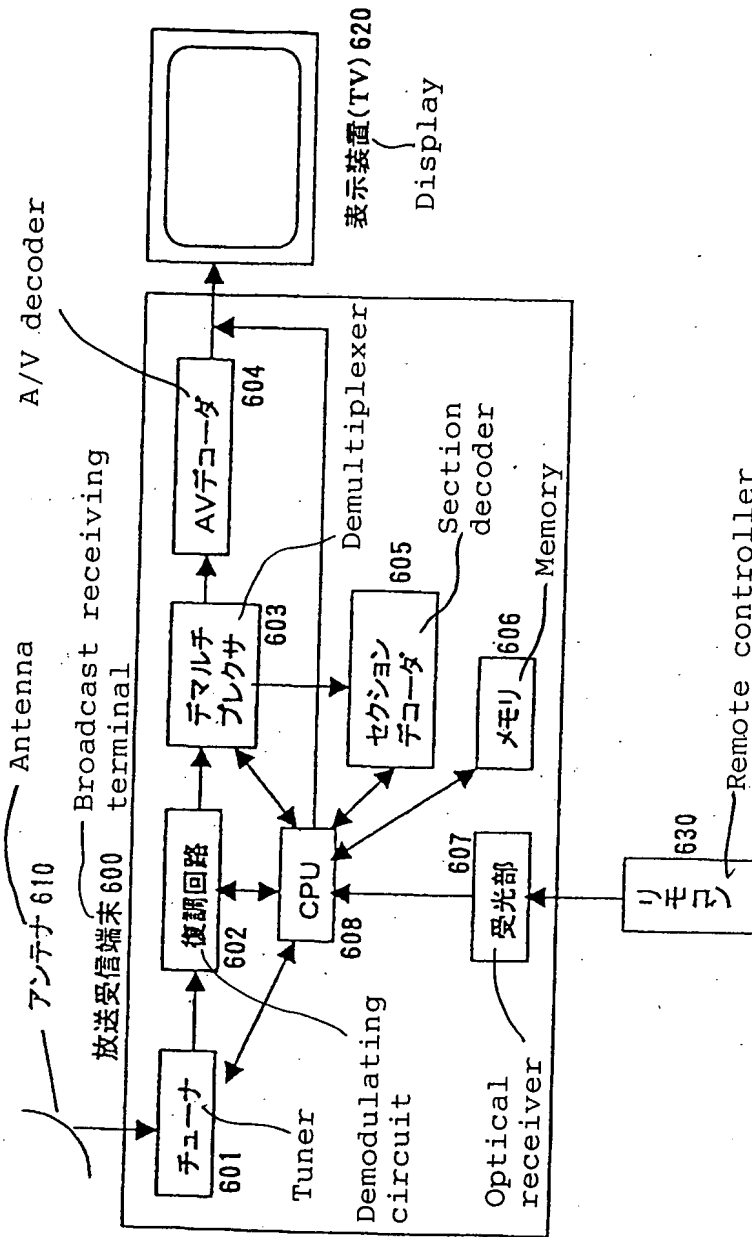


【図5】

Fig. 5



【図6】 Fig. 6



[Fig. 7]

BAT (Bouquet Association Table)

Bouquet ID	5		
Bouquet Name	Station A		
TS-ID	20		
Service ID	1	2	3

Bouquet ID	6						
Bouquet Name	Station B						
TS-ID	30			40			
Service ID	4	5	6	7	8	9	

Sub-table is provided for every bouquet.

NIT (Network Information Table)

Network ID	5		
TS-ID	20	30	40
Tuning Information	23.5	50.1	67.8

PAT (Program Association Table) (Packet ID=0)

Program Number	1	2	3
Packet ID of PMT	123	456	789

PAT in which all the programs carried by the TS are described, is transmitted through every TS

PMT (Program Map Table) (Packet ID=456)

Program Number	2		
ES Type	Video	Audio	Audio
Packet ID of ES	122	455	788

Sub-table is provided for every bouquet.

PMT concerning all the programs is transmitted through every TS.

[Fig. 8]

EIT (Event Information Table)

Service ID	4			
TS ID	30			
Program ID	30	35	40	42
Program Name	Morning weather	Monocycle	Morning news	Morning vegetables
Showtime	97/11/14 4:00	97/11/14 5:00	97/11/14 6:00	97/11/14 7:00
Duration of Program	60 min.	60 min.	60 min.	60 min.
				Get up!
				89

Table is provided for every service.

Likewise, tables are provided for Service IDs 1-3, 5-9.

SDT (Service Description Table)

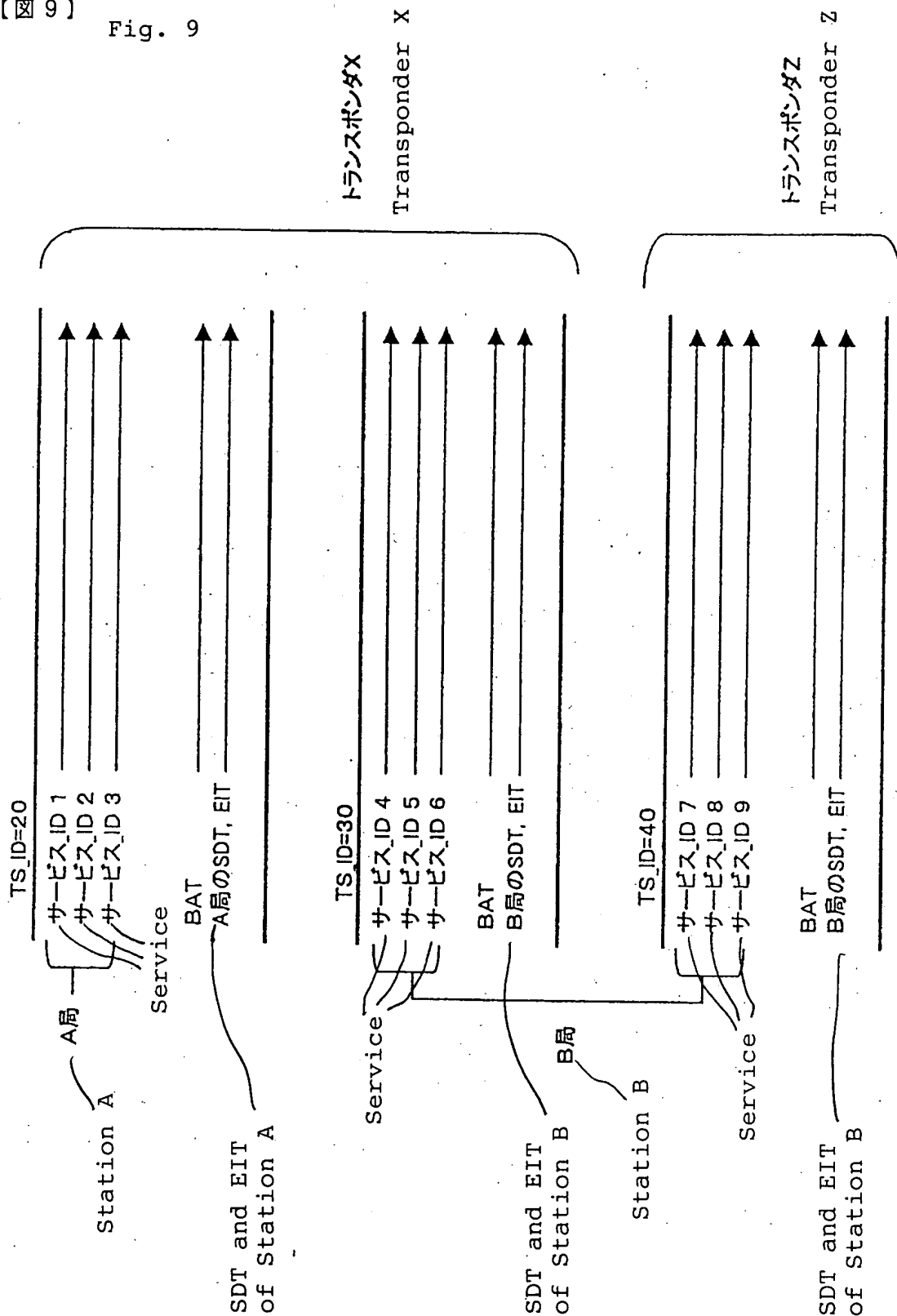
TS ID	30		
Service ID	4	5	6
Service Name	Movie channel	Children TV	News!
Service Type	NVOD	Digital TV	FM radio

TS ID	40		
Service ID	7	8	9
Service Name	Sports Channel	Madam TV	Kingdom of Comic
Service Type	Digital TV	Digital TV	Digital TV

Table is also provided for TS whose TS ID is 20.

【図 9】

Fig. 9



[Fig. 10]

Program Guide of Station B								
	4	5	6	7	8	9		
	Movie Channel	Children TV	News!	Sports Channel	Madam TV	Kingdom of Comic		
4:00	From now	Sleepy	Morning weather	Well, well	Tell me	How to cook stew		
5:00	Good night	Voice mail	Monocycle	Orange	Wow			
6:00	Topical news	Long life	Morning news	Elephants	Don't you Know it?			
7:00	Newspaper reading	Gate ball	Morning vegetables	Validation	Children	News!		
8:00	I'm going	Monkeys	Get up!	Te-bi-bi	Digital TV	FM radio		

[Fig. 11]

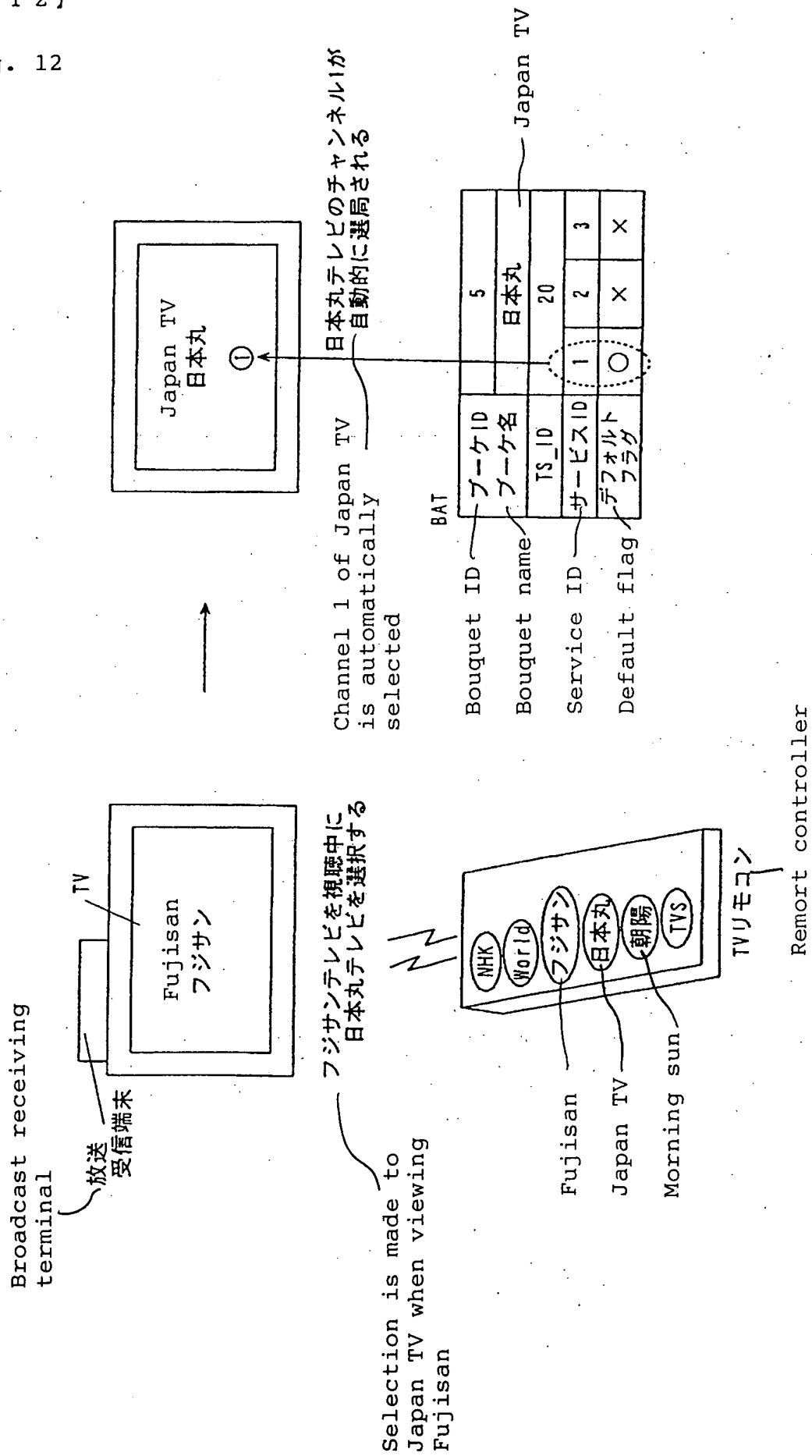
BAT (Bouquet Association Table)

Bouquet ID	5		
Bouquet Name	Station A		
TS ID	20		
Service ID	1	2	3
Default Selection	○	×	×

Bouquet ID	6					
Bouquet Name	Station B					
TS ID	30			40		
Service ID	4	5	6	7	8	9
Default Selection	○	×	×	×	×	×

【図12】

Fig. 12



[Fig. 13]

EIT

Service ID	6				
TS ID	30				
Program ID	30	35	40	42	89
Program Name					
Showtime					
Duration of Program					
Event link information					

Service ID	7				
TS ID					
Program ID	50	51	52	53	54
:					
:					
Event link information			Refer to Service 6, Event 40 of TS30		

Service ID	8				
TS ID					
Program ID	60	61	62	63	64
:					
:					
Event link information			Refer to Service 6, Event 40 of TS30		

[Fig. 14]

Three channels are indicated being linked since channels 7, 8 are linked to the program of 6 as event link information.

Channel	5	6	7	8
3:00	SDTV	SDTV	SDTV	SDTV
4:00		HDTV		
5:00				
6:00		Datacasting	Datacasting	SDTV
7:00				Audio broadcast
8:00				SDTV

[Fig. 15]

Upon selection of any one of the programs, all of the identical programs are selected.

Channel	1	2	3	4
15:00	SDTV	SDTV	SDTV	SDTV
16:00	HDTV	HDTV		HDTV
17:00				
18:00	SDTV	Datacasting		Audio broadcast
19:00		Datacasting		
20:00				SDTV

[Fig. 16]

EIT (Event Information Table)

Service ID	4					
TS ID	30					
Program ID	30	35	40	42	89	
Program Name	Morning weather	Monocycle	Morning news	Morning vegetables	Get up!	
Showtime	97/11/14 4:00	97/11/14 5:00	97/11/14 6:00	97/11/14 7:00	97/11/14 8:00	
Duration of program	60 min.	60 min.	60 min.	60 min.	60 min.	
Bandwidth information	5Mbps	5Mbps	18Mbps	6Mbps	4Mbps	

Service ID	5					
TS ID	30					
Program ID	31	32	41	43	88	
Program Name	Morning WR	Tricycle	Help	Help me	Please get up	
Showtime	97/11/14 4:00	97/11/14 5:00	97/11/14 6:00	97/11/14 7:00	97/11/14 8:00	
Duration of program	60 min.	60 min.	60 min.	60 min.	60 min.	
Bandwidth information	18Mbps	5Mbps	9Mbps	6Mbps	6Mbps	

[Fig. 17]

4:00	Morning weather	Morning WR	
5:00	Monocycle	Tricycle	
6:00	Morning news		Help
7:00	Morning vegetables	Help me	
8:00	Get up!	Please get up	

[Fig. 18]

Today's program guide				
	30	31	32	33
3	Alarm clock TV	Morning news All sorts	Medical information- Influenza-	Distant lecture
4	With daddy	Japanese children's song *Where are you from?		Cooking for tomorrow
5	Let's play with Finnish	*From Higo. Where Higo? *It's in Kumamoto.		Cooking for the day after tomorrow
6	We have no function		Weather forecast World weather	
7	Music program "Elephant"	News seven o'clock	C++Introductory	
8	Let's go to the zoo	Traffic information Metropolitan Expressway	A++Introductory	
9	Let's go to the fun park	Traffic information Tomei superhighway	X++Introductory	

Channel 30: 2/9 of the whole bandwidth
 Channel 31: 4/9 of the whole bandwidth
 Channel 32: 2/9 of the whole bandwidth
 Channel 33: 1/9 of the whole bandwidth

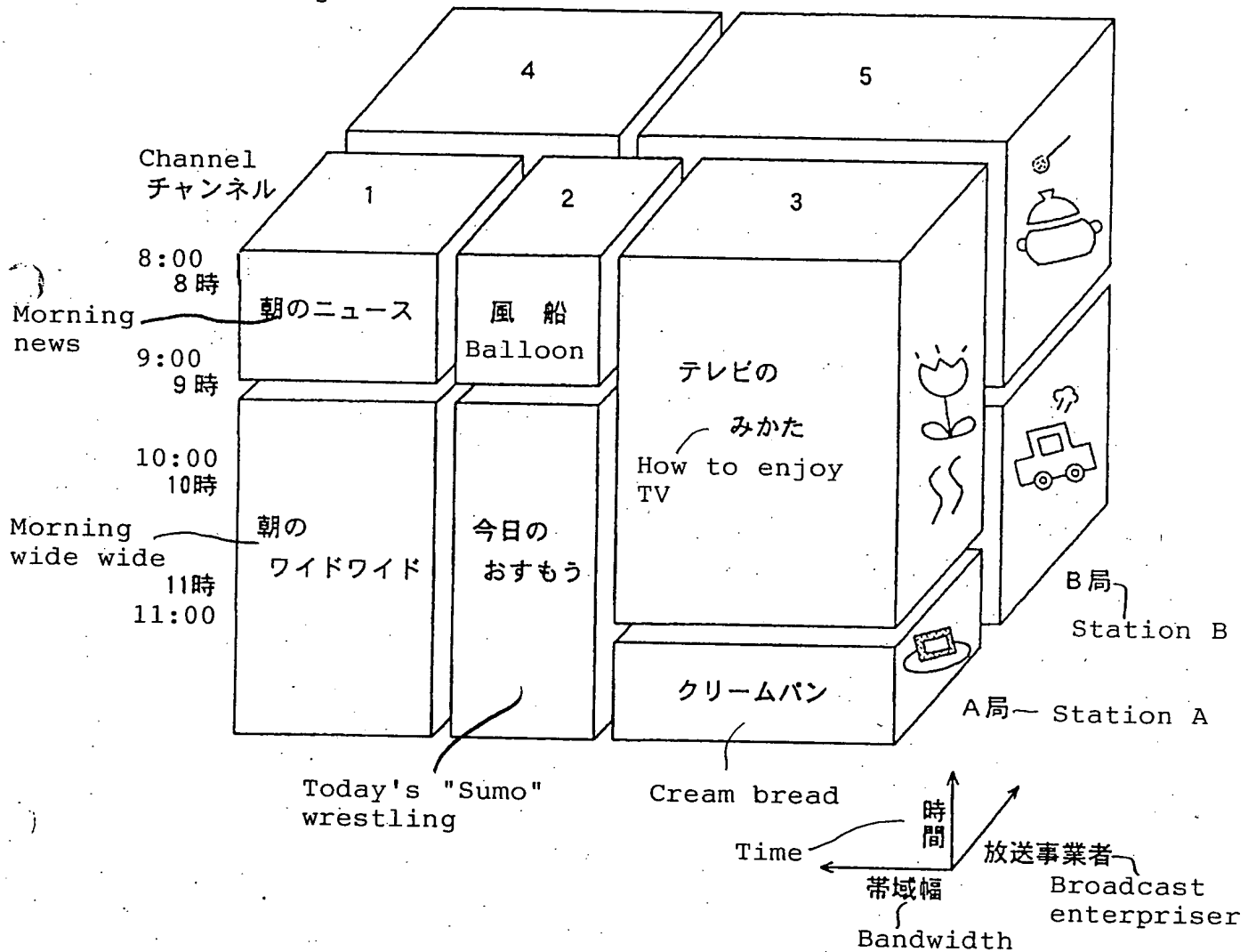
The above is described in SDT.
 The width ratio between individual
 channels in the program guide is the
 same as the bandwidth ratio.

【図19】 Fig. 19

Service Type	Datacasting		Music	
	サービス種	データ放送	音楽	
Display width ratio	表示幅比	1	1	5 15

【図20】

Fig. 20

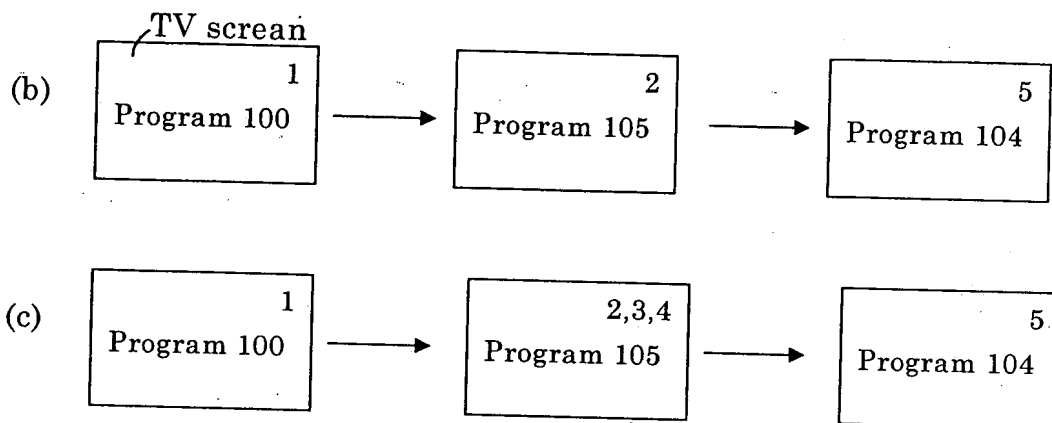


[Fig. 21]

(a)

Program guide for Station A					
CH	1	2	3	4	5
3:00	Program 100	101	102	103	104
4:00		105			
5:00	106	107	108	109	113
6:00		110	111	112	

In case channel is switched starting from 1 at this time

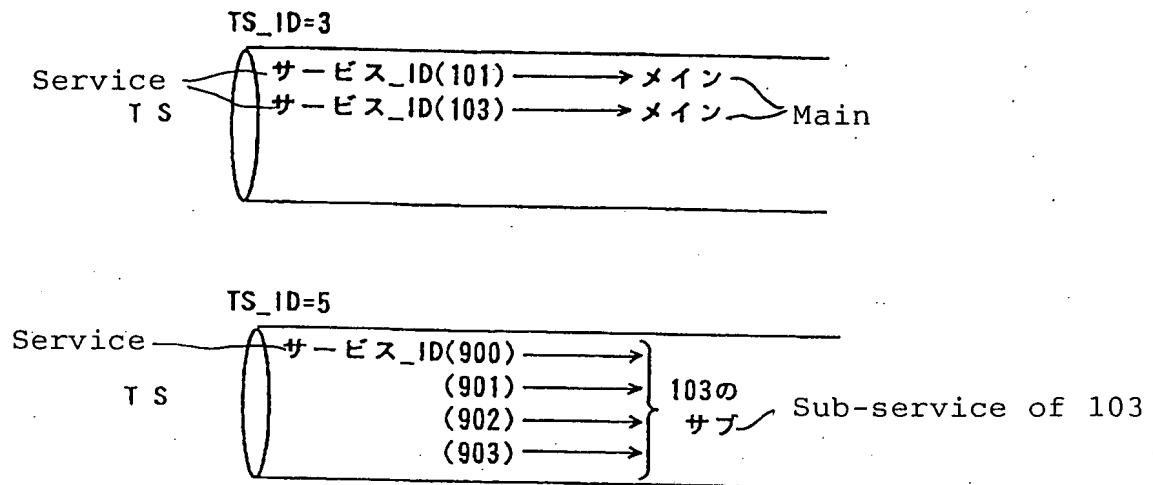


[Fig. 22]

Service	101	103	900	901	902	903
12:00	SDTV	Music	Music 1	Music 2	Music 3	Music 4

Services 900-903 are the sub-services of Service 103

【図 2.3】 Fig. 23



[Fig. 24]

SDT

TS ID	3	
Service ID	101	103
Service Name	Weather!	MC
Service Type	SDTV	Music
Main/Sub	Main	Main
Reference Service	(None)	900-903
Reference TS ID	(None)	5

[Fig. 25]

TS ID		3		5			
Service ID		101	103	900	901	902	903
Service Name		Weather!	MC	Music 1	Music 2	Music 3	Music 4
Service Type		SDTV	Music	Music	Music	Music	Music
Main/Sub		Main	Main	Main	Main	Main	Main
Ref. Service		(None)	900-903	103	103	103	103
Ref. TS ID		(None)	5	3			
Specified Station		(None)	(None)	○	×	×	×
Viewer's Attribute	Age	(None)	(None)	19 or more	1-5	More than 60	20-30
	Area	(None)	(None)	Nationwide	Nationwide	Tokai	Hokkaido
Genre		(None)	(None)	Movie	Sports	News	News

[Fig. 26]

EIT

Service ID	101					
TS ID	3					
Program ID	50	51	52	53	54	55
Program Name	Weather of Tohoku	Weather of Kansai	Weather of Kanto	Tomorrow	The day after tomorrow	One month
Showtime	10:00	11:00	12:00	12:30	13:00	13:30
Duration of Program	60 min.	60 min.	30 min.	30 min.	30 min.	30 min.

[Fig. 27]

EIT

Service ID	103					
TS ID	3					
Program ID	3	4	5	6	7	8
Program Name			Music C			
Showtime			12:00			
Duration of Program			30 min.			

[Fig. 28]

EIT

Service ID	900					
TS ID	5					
Program ID	200	201	202	203	204	205
Program Name			Music C ₁			
Showtime			12:00			
Duration of Program			30 min.			

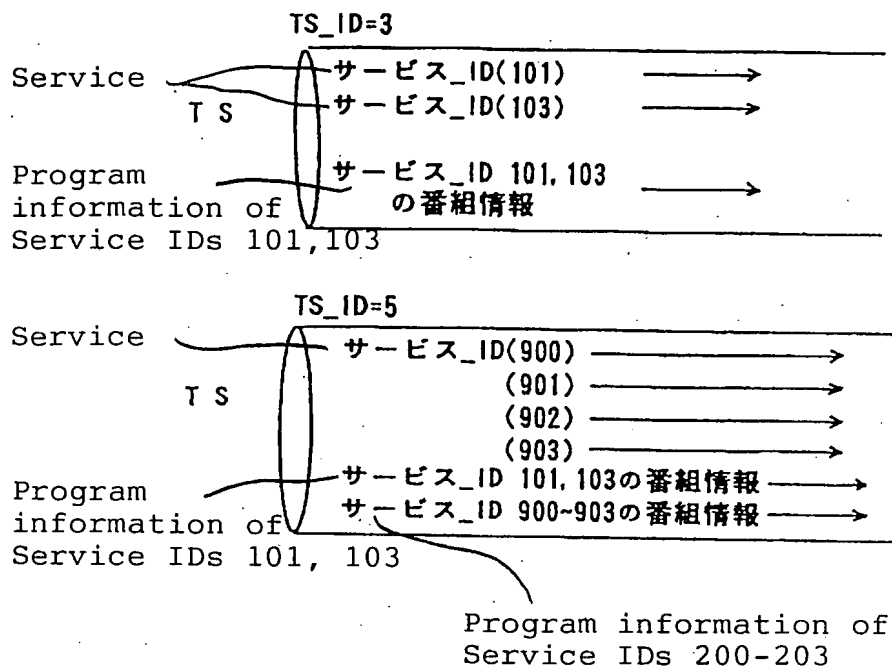
Service ID	901					
TS ID	5					
Program ID	206	207	208	209	210	211
Program Name			Music C ₂			
Showtime			12:00			
Duration of Program			30 min.			

Service ID	902					
TS ID	5					
Program ID	1000	1001	1002	1003	1004	1005
Program Name			Music C ₃			
Showtime			12:00			
Duration of Program			30 min.			

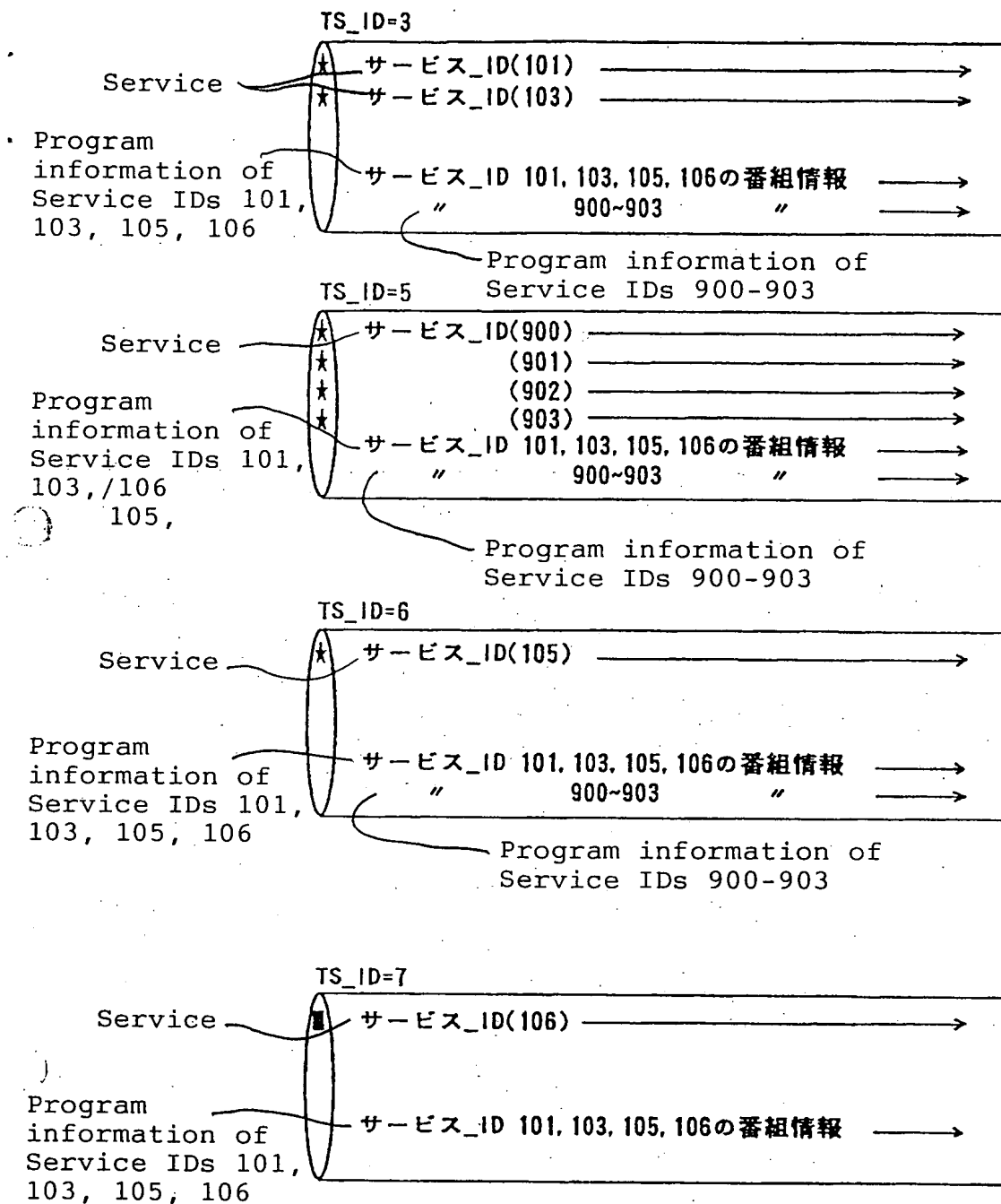
Service ID	903					
TS ID	5					
Program ID	1100	1101	1102	1103	1104	1105
Program Name			Music C ₄			
Showtime			12:00			
Duration of Program			30 min.			

【図29】

Fig. 29



【図30】 Fig. 30



[Fig. 31]

(a)

Today's program				
	30	31	32	33
3	Alarm clock TV	Morning news All sorts	Medical information - Influenza -	Music channel
4	With daddy	Japanese children's song *Where are you from? *From Higo. Where Higo? *It's in Kumamoto		Cooking for tomorrow
5	Let's play with Finnish			Cooking for the day after tomorrow
6	We have no function		Weather forecast World weather	
7	Music program "Elephant"	News seven o'clock	C++Introductory	
8	Let's go to the zoo	Traffic information Metropolitan Expressway	A++Introductory	
9	Let's go to the fun park	Traffic information Tomei superhighway	X++Introductory	

The "Music channel" is the one wherein a plurality of channels are bound. The program of dot meshing in the program guide means that it is the program resulting from binding. "Detailed indication" of the "Music channel" is shown in Fig. b.

Selection

(b)

Details of "Music channel"

	50	51	52	53	54	55
3	Popular ballads of 60's	Popular ballads of 70's	Popular ballads of 80's	Popular ballads of 90's	Popular ballads of future	Instructive popular ballads

	56	57	58	59	60	61
3	Idols of 60's	Idols of 70's	Idols of 80's	Idols of 90's	Idols of future	Top 10 of 60's

	62	63	64	65	66	67
3	Top 10 of 70's	Top 10 of 80's	Top 10 of 90's	Top 10 of this month	Jazz	Drinking place

	68	69	70	71	72	73
3	Alibi	Challenge STEP 3 rd grade	Challenge STEP quasi-2 nd grade	Challenge STEP 2 nd grade	Challenge STEP quasi-1 st grade	Challenge STEP 1 st grade

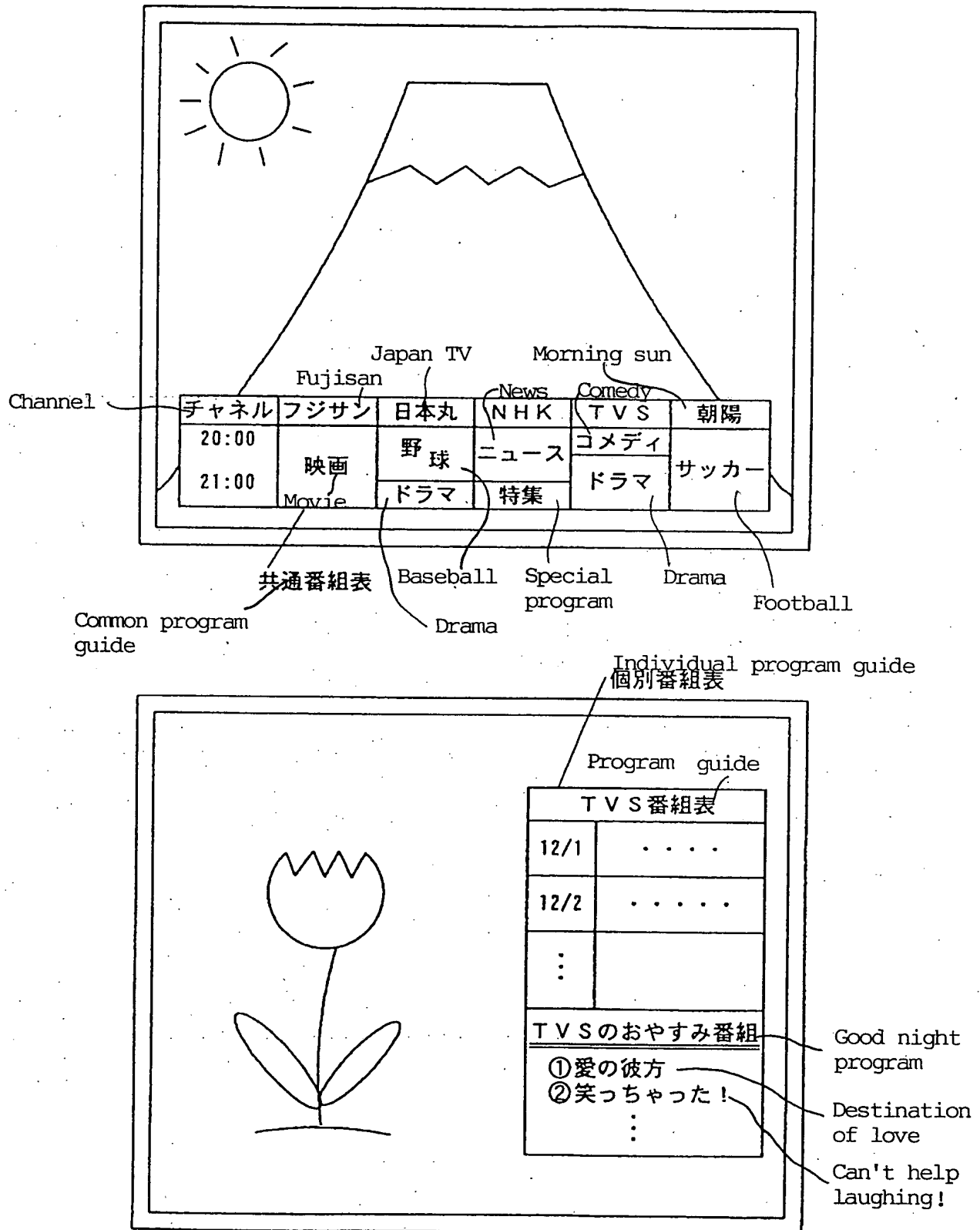
Previous

Next

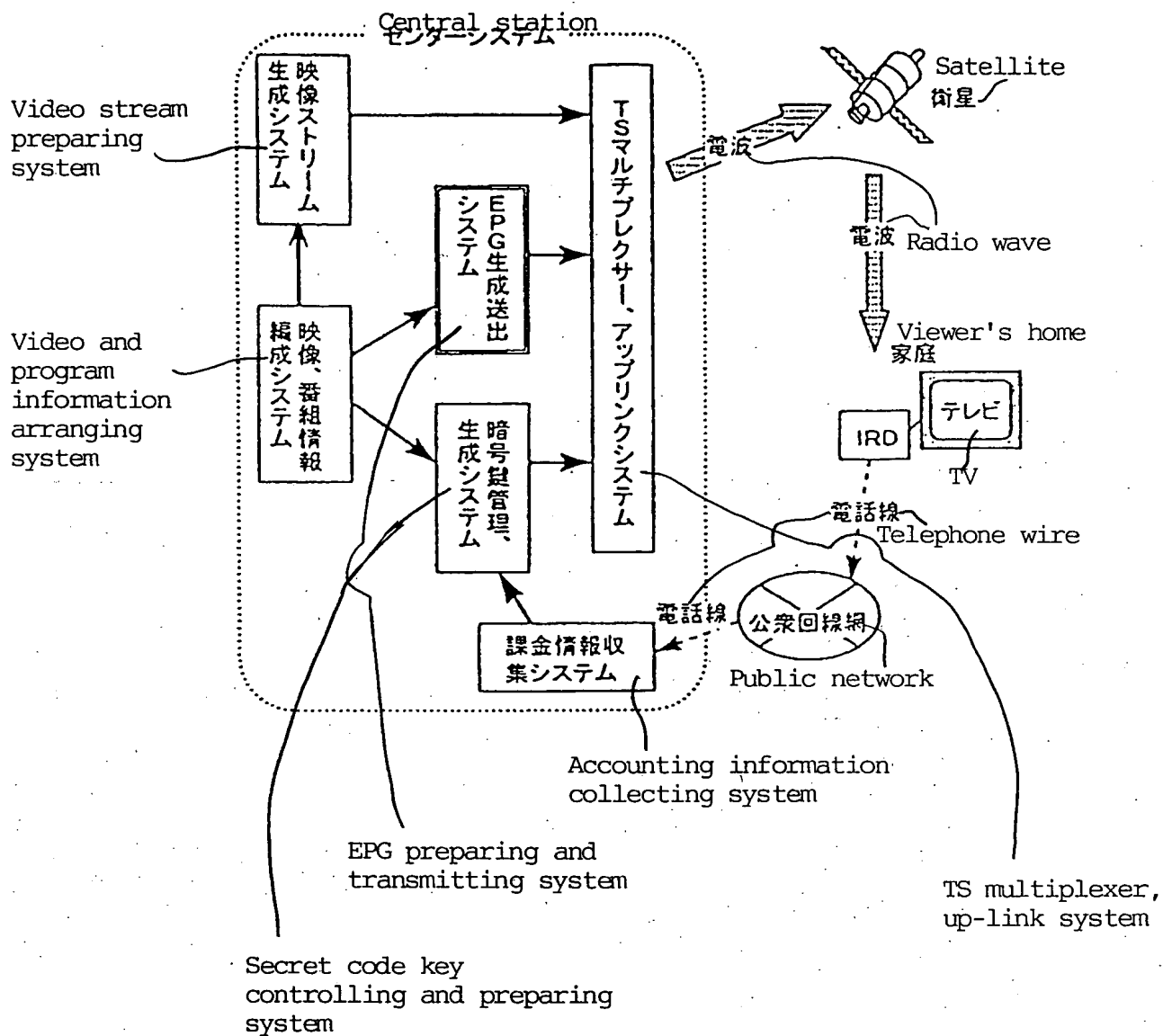
Return

【図 32】

Fig. 32



【図 33】 Fig. 33



[Document Name] Abstract

[Summary]

[Purpose] To provide a program information preparing and transmitting apparatus which enables a common program guide and an individual program guide to be displayed with a receiving terminal while effectively utilizing a band.

[Solving Measure] The apparatus comprises; a broadcast enterpriser service correspondence information 7 which indicates services presented by broadcast enterprisers and a list of the broadcast enterprisers; a program information preparing unit 1 which prepares program information for every broadcast enterpriser on the basis of program information detail degree setting information 4 describing program information to be transmitted a transport stream through which at least one of the services presented by a broadcast enterpriser is broadcasted, and program information to be transmitted to a transport steam where no broadcasting is performed; and a program information transmitting unit 2 for distributing and outputting the program information to individual transport streams.

[Selected Figure] Fig. 1

【Document Name 】

Office Correction Data

【Corrected Document】

Patent Application

<Recognized Information · Additional Information>

【Applicant(s)】

【Identification Number】

000005821

【Address or Abode】

1006, Oaza Kadoma, Kadoma-shi,
Osaka

【Name or Designation】

Matsushita Electric Industrial
Co., Ltd.

【Agent】

Petitioner

【Identification Number】

100099254

【Address or Abode】

c/o En · Ohashi Tokkyo Jimusho,
Arikoberu 305, 2-41, Hyakunincho
2-chome, Shinjuku-ku, Tokyo

【Name or Designation】

Masaaki EN

【Agent】

Petitioner

【Identification Number】

100100918

【Address or Abode】

c/o En · Ohashi Tokkyo Jimusho,
Arikoberu 305, 2-41, Hyakunincho
2-chome, Shinjuku-ku, Tokyo

【Name or Designation】

Kouji OHASHI

【Agent】

Petitioner

【Identification Number】

100105485

【Address or Abode】

c/o En · Ohashi Tokkyo Jimusho,
Arikoberu 305, 2-41, Hyakunincho
2-chome, Shinjuku-ku, Tokyo

【Name or Designation】

Masanori HIRANO

【Agent】

Petitioner

【Identification Number】

100108729

【Address or Abode】

c/o En · Ohashi Tokkyo Jimusho,
Arikoberu 305, 2-41, Hyakunincho
2-chome, Shinjuku-ku, Tokyo

【Name or Designation】

Hiroki HAYASHI

APPLICANT'S PERSONAL HISTORY INFORMATION

Identification Number [000005821]

1. Date of Change August 28, 1990

[Reason for Change] For New Registration

Address: 1006, Oaza Kadoma, Kadoma-shi, Osaka

Name: Matsushita Electric Industrial Co., Ltd.